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ILLUSTRATIONS.

St. Mary Woolnoth: West Front.—Drawn by Mr. W. Curtis Green ..... *Double-Page Photo-Litho.*
St. Mary Woolnoth: Sections.—Measured and drawn by Mr. A. C. Bossom ..... *Two Double-Page Photo-Lithos.*
Royal College of Music, South Kensington: Details of New Concert Hall.—Mr. Sidney R. J. Smith, F.R.I.B.A., Architect ..... *Double-Page Photo-Litho.*

Blocks in Text.

Plan of St. Mary Woolnoth. Measured and Drawn by Mr. A. C. Bossom .. Page 58 | Roya College of Music, New Concert Hall. Ground Floor Plan ..... Page 59
Diagrams Illustrating Students' Column ..... Pages 61 and 62

CONTENTS.

Building Estates and the Easement of Light 45
Ancient Churches of Famagusta 46
Notes 46
Municipal Buildings Competition, Hereford 48
Glasgow International Exhibition 50
British Association of Waterworks' Engineers 51
Detecting and Preventing the Pollution of Public Water Supplies 52
A New Test for the Fineness of Cement 53
The London County Council 54
Applications under the 1894 Building Act 54
Books: A. R. Craggs' "Hints to Young Valuers: a Practical Treatise on the Valuation of Property"; Henry Adams' "Designing Ironwork"; Rev. W. D. Sweeting's "The Cathedral Church of Ely"; H. J. L. J. Massé's "The Cathedral Church of Bristol: a Description of its Fabric and a Brief History of the Episcopal See"; Rev. T. Perkins's "The Abbey Churches of Bath and Malmesbury and the Church of St. Laurence, Bradford-on-Avon"; T. C. Worsfold's "The French Stonehenge: an Account of the Principal Megalithic Remains of the Morbihan Archipelago"; J. Chalkley Gould's "Early Defensive Earthworks"; N. F. Layard's "A Brief Sketch of the History of Ipswich School;" J. Alexander's "Weights and Measurements of Sheet Lead" 55
Books Received 56
London Building Act, 1894 57
Illustrations:—
St. Mary Woolnoth 57
New Concert Hall, Examination Hall, &c., Royal College of Music 59
America and the Cement Industry 60
Correspondence:—
Portland Cement 60
The Student's Column.—Gas and Gas Fittings—3 60
General Building News 62
Foreign 63
Sanitary and Engineering News 64
Miscellaneous 64
Capital and Labour 64
Legal:—
Point under the London Building Act, 1894 64
Case under the London Building Act, 1894 65
Recent Patents 65
Meetings 66
Some Recent Sales of Property 66
Prices Current of Materials 67
Tenders 69

Building Estates and the Easement of Light.

WE cannot but fear that the man who is not a lawyer will find himself in a mental fog in regard to the law as to the easement of light in connexion with building estates. This is the more to be regretted because the subject is one of practical and increasing importance, and might be made clear and settled by a very small amount of legislation, though in these days the legislative machine drives so heavily that it is almost impossible to secure the passing of any reforms.

That cardinal principle of law, that a man cannot derogate from his own grant, is perfectly well known to most of our readers, and the youngest student should be aware that if a man grant a piece of land on which the grantee erects a house, neither the grantor nor his heirs and representatives can afterwards obstruct the light of such house, unless the grantee's rights have been limited in the first instance.

In addition to the exception to the general right founded upon express agreement, there has been added by judicial decision another, namely, that when the parties intended that there should be a limitation, then the Courts of Law will not enforce the grantee's right. In some cases such a limitation is obvious. There is, for example, the leading case of a railway company which, having by legislation power to take land for the purpose of its undertaking, disposed of a portion of the surplus land, together with a house, and subsequently in the course of its business erected an embankment and obscured the light of the house. Here it was plain that the grantee had no right to unobscured light. He knew when he purchased the property that the vendors were intending to make a railway, and it would have been contrary to the most elementary commonsense could the grantee have interfered with their undertaking.

When, however, we come to the case of building estates we find ourselves in a difficulty. That the buyer of a plot of land on a building estate, who clearly knows that houses will be erected around that which he is going to build, ought not to complain of a limitation of his right, appears obvious. It is certain also that the law recognises this exception. Unfortunately, however, there appears to be no rule deducible from the decisions which will enable the layman without difficulty to know what are the respective rights of grantors and grantees. The leading case in favour of the exception is that of the Birmingham Banking Company *v.* Ross, which was decided by Mr. Justice Kekewich and by the Court of Appeal in 1888. In that case the predecessors in title of the plaintiffs obtained from the Corporation of Birmingham a house looking over a passage 20 ft. wide on to some low buildings. These were subsequently pulled down and higher buildings erected in their place by a person to whom the Corporation had demised the land, and these new buildings obstructed the plaintiff's lights. *Primâ facie* this would clearly have been a case in which the plaintiff was entitled to have his lights protected by the law. But, said Mr. Justice Kekewich, "Mr. Daniell, under whom the plaintiffs claim, must be taken to have known that the Corporation of Birmingham had made large purchases of land for the purpose of constructing a new and important thoroughfare, and that this could properly be done and that they could recoup their expenditure only by selling or letting the land for building purposes. He must be taken to have known what class of buildings were likely to be erected in a broad street in a commercial town." It is clear that whilst the general character of the Corporation's building scheme was shown on a plan, no details were given as to the actual size of the houses to be built on the land. But Mr. Justice Kekewich is entitled to say that there was evidence of a proposed building scheme. "If," said Lord Justice Cotton in the Court of Appeal, "the contention of the plaintiffs is right, it would entirely prevent the Corporation from utilising the land in any way except by putting up a low building." The result, therefore, was that this Court also held that there was no implied obligation on the vendors not to obstruct the light of this house.

When we look at the recent case of Pollard *v.* Gare, also decided by Mr. Justice Kekewich in the present year, it becomes obvious that the intention of the parties must be looked at very closely; and even this—if misunderstood by each other—will not help us much. In that case, two owners of land at Staines, fronting the Thames and the towing-path, were proposing to let or sell it in plots having each a frontage to the towing-path of about 66 ft. and extending backwards for about four times the length. The plaintiff's predecessors took two of these plots on lease, agreeing to build on them a house of a specified character. This they did, and it stood a short distance from the boundary of another plot. The adjoining plots were subsequently sold to the defendant, who, in order to test his right, erected a hoarding for the purpose of obscuring the light of the plaintiff's house. But Mr. Justice Kekewich decided that the plaintiff had a right to his light without obstruction. "It was urged on behalf of the defendant that there was to the knowledge of Mrs. H. at the date of her agreement a building scheme affecting the land, the subject of that agreement, and the adjoining land. What that building scheme was nobody pretended to say, and it is clear that there was no building scheme as the phrase is generally used and understood. The estate was marked out on the plan, if not on the ground, in building lots, and there was also a building line marked on the plan, so as to extend through all the lots; but these are just the facts which in Broomfield *v.* Welham were held insufficient to restrict the application of the doctrine. The right to build remains, but there is nothing from which it can be inferred that the grantors were entitled to build so as to interfere with the access of light."

Broomfield *v.* Williams, to which in the above quotation reference is made, was a decision of the Court of Appeal. The facts in that case showed that the plaintiff knew that it was intended to build on the adjoining land, that he had in fact

taken part of a building estate. But, said Lord Justice Lindley, "it was quite possible to build on that adjoining land without darkening the windows of the house conveyed." In other words it would appear that the Court did not perceive any knowledge on the part of the purchaser that, by the carrying out of the building scheme, his windows would be darkened. On the contrary, it appears to have been in the contemplation of both parties that the defendant would not build a house higher than that of the plaintiff. In the later case of Pollard *v.* Gare, there do not appear to be any indications of any implied agreement that all the houses would be of a certain height; and that being so, and as the plaintiff likewise knew that the adjoining plot would be built on, it is not altogether easy to see how the plaintiff could properly object to some obscuration of light. It seems not to be unreasonable that if a man purchases a plot of land on a building estate, he should be prepared to have his light obscured, unless he makes a definite agreement with the vendor in order to protect himself, or assures himself by means of plans and elevations that there is a limitation under the scheme to the size of the houses to be erected. To some extent, a man who takes possession of a plot of building land must expect some kind of obscuration to his light. In the last case, that of Pollard *v.* Gare, the purchasers of the plot adjoining that of the plaintiff might very well have assumed that they were at liberty to build as they liked, from the very fact that there was no apparent restriction in the manner of building.

One thing, however, is clear, that it is desirable for owners of building estates, before selling plots of land for building purposes, to make the scheme so systematic that these disputes will not arise. A surveyor can always formulate conditions as to the character of the houses to be erected which, while possibly taking away the full light to all rooms, will not so obscure such rooms as to make them disagreeable for habitation. What is needed is a certain amount of give and take between the owners of the separate plots, but this object cannot be satisfactorily attained unless in the first instance some kind of uniform scheme is planned by an architect. Otherwise the owner of the first plot which is disposed of may be in a position seriously to hamper the development of the rest of the estate, and the respective rights of the several occupiers are left in an uncertain and unsatisfactory state.

ANCIENT CHURCHES OF FAMAGUSTA.

THE famous old city of Famagusta —where three hundred years ago a handful of Italians managed to keep at bay the innumerable hordes of savages of the Ottoman army during a long year's siege—has recently been the scene of some most interesting excavations.

After the complete disappearance of the Christian population of Famagusta, all the former Italian residents having been killed, tortured to death, or carried away slaves to Constantinople, the fortress was placed in a state of repair, and confided to a Mohammedan garrison. Several slight alterations were made in the disposition of the defences, and certain loophooled walls were built on to the cannon embrasures for musketeers, the Turks evidently not employing so many big guns as the Italians. In this way the old Italian work is in some places quite masked and covered over. The interior of the city would appear to have been almost abandoned to a very small population; the hordes which had been attracted by the Turkish generals with promises of loot, came merely to plunder and ravage the island, and probably returned to their native countries on the mainland immediately this object was attained.

During the twenty years of the British occupation of the island the city of Famagusta has suffered more than at any earlier period of its history. It has been turned into a quarry of building stone for Port Said (which may be considered a Famagusta *redivivus*) and other places in the Levant. At the present day very little in the way of domestic architecture remains, and where the houses once stood are patches of rough ground, browsed over by goats and donkeys. The churches have to some extent escaped the fate of the domestic buildings, and it is the ecclesiastical architecture which has afforded M. Enlart so much material for his book on the mediæval antiquities of Cyprus, referred to in our last issue.

In prosecuting his studies, M. Enlart obtained the consent of the English officials to allow him to excavate some of these old churches, and to remove the masses of *debris* encumbering their interiors. Only those churches which had suffered the most from the Turkish bombardment afforded an opportunity for finding anything interesting; those which still retain their vaulted ceiling have, of course, lost all traces of their ancient furniture and tombstones, since they were always turned into stables or grain-stores by the Turks. The beautiful fourteenth-century cathedral was the only church turned into a mosque, a sufficient proof that since the Mohammedan conquest the population of the city must have shrunk considerably.

The churches investigated by M. Enlart are the Carmine, S. Francisco, and the old Orthodox Greek Cathedral of St. George. All these suffered very much at the bombardment; their vaultings were destroyed and crushed down into the naves and side chapels; they seem to have been abandoned as they fell. In the case of the side chapel which M. Enlart has unearthed at S. Francisco, when the excavators arrived at the level of the ancient tombstones constituting its floor, they found human remains which had evidently been crushed beneath the weight of the falling vaults. In the case of the Carmine church, the cannon balls and other signs of the bombardment show that the place has not really been touched for more than three hundred and thirty years.

It is difficult to imagine the ruin of these strongly and scientifically built vaults being due to the comparatively small iron cannon balls of the period, which may be picked up by hundreds still in Famagusta. It is not, perhaps, improbable that the Turks employed for the purpose of destroying a town the enormous stone shot which are so often found stored wherever during the fifteenth to seventeenth centuries they have left traces of their presence. These enormous masses of stone pitched into a town by means of mortars would do terrible execution on both the buildings and the inhabitants, as they split into a thousand pieces at the moment of impact.

The excavations at St. George of the Greeks will probably prove of the very greatest interest; the débris is full of fragments of stained glass, and probably many curiosities may remain at the level of the pavement. Unfortunately M. Enlart is obliged to leave within a few days, as the length of time for his visit granted by the French Government is coming to an end, and the object for which he was specially commissioned has been attained—namely a supplement to his great book on the architecture of the Lusignan period in the island.

Considering the great interest attaching to Famagusta and the fact that these remains are found in so remarkably perfect a condition, it seems the greatest of misfortunes from an archæological point of view that the whole matter should not be carried out in a more systematic and conservative manner. In any other country such "finds" would be carefully protected by hoardings or walls, and it is greatly to be feared that if something of this kind is not done immediately these interesting discoveries will quickly disappear, sacrificed to the wanton pleasure of idle Anatolian peasants. The wonderful series of tombstones covering the graves of French and Italians, which owe a great part of their interest to being *in situ*, will be broken up or stolen; and many of them have a perhaps unique interest in relation to the history of costume.

NOTES.

Lord Wemyss and the Government Offices.

LORD WEMYSS has obtained a large majority in the House of Lords in favour of his proposal for making models of the two blocks of Government Offices before the buildings are proceeded with. It is not often that either Chamber shows sufficient interest in art to take any decisive line on a subject of that kind, and we presume that the noble lords who voted for the models have some vague idea that they are thereby furthering the cause of public architecture. We do not see, however, that the expenditure will now result in anything beyond affording a little show for the public; they do not understand drawings, and they will be interested to see exactly what the two new buildings will look like. Lord Wemyss seems to have an idea that there is some mysterious influence in the mere fact of making a model of a building, and that this alone is wanted to revive English architecture. We have the highest opinion of the value of models, not however as toys for the public amusement, but as a means for an architect testing the lines and composition of his own design, for which purpose a rough model during the earlier stages of a design is of far more value than a finished model at a later stage. The money which would have to be expended on the proposed models is, relatively, a trifling matter; but it will involve a loss of time in proceeding with the new buildings, and for no good purpose, for we suppose it is not contemplated to alter the two architects' finished designs after their death—to do so would be a great injustice and unkindness to their memory.

"New Art" Furniture at South Kensington

WE entirely sympathise with the protest which has been made in the *Times* by four architects against the acquisition and exhibi-

tion at the Victoria and Albert Museum of specimens of furniture of what is absurdly called "L'Art Nouveau." We have noticed from time to time in these columns the prevalence recently, in German and French furniture work, of the employment of eccentric twists and curves, as if the object were to surprise one by working the legs of tables and chairs into unexpected and contorted forms, and inserting vagaries of detail which have no relation to structure. This is a new fashion only, not a new art; it does not deserve that name; but it appears that a Mr. G. Donaldson has been anxious that this country should be inoculated with the same folly, and has accordingly bought and presented to the Museum a selection of these furniture vagaries out of the Paris Exhibition, which are placed at the inner end of the tapestry-room at South Kensington. It is a gift of worse than doubtful value. Hitherto the modern English school of furniture design has kept free from these extravagances, and has been notably superior in style and in pure taste to any continental school. Now the examples of the bad and tawdry stuff which is called "New Art" furniture receive the *imprimatur* of the National Art Museum; are put there to be studied and copied, to the detriment of the taste of our own artisans; and (worse still) are, we are told, to be sent round to the provinces, so that the taste of the provincial art-workman may be alike corrupted. This is not what the South Kensington Museum was founded for; it was to be a storehouse of the best art, not a show-room for vagaries in design.

Appeals under the Workmen's Compensation Act.

IT appears doubtful if the Bill introduced by the Lord Chancellor in the House of Lords to amend the Judicature Acts will in the press of business in the House of Commons become law during the present session. One portion of that Bill transfers appeals under the Workmen's Compensation Act from the Court of Appeal to a Divisional Court of the King's Bench Division. It cannot be said that the judgments of the Court of Appeal in this Act have been satisfactory, but that has not a little been due to the vague phraseology and bad drafting of this statute. The Court of Appeal has taken a narrow and technical view of the Act; the House of Lords, under the guidance of the Lord Chancellor, a wider and more liberal view. But taken as a whole the decisions of a Divisional Court are less likely to be regarded as satisfactory than are those of the Court of Appeal, and there will be many who would prefer to leave the appeals as they now are. Should the measure become law its efficiency will depend on the action of the Lord Chief Justice with whom will rest the composition of the Divisional Court. Some judges of the King's Bench Divisional Court are notoriously bad lawyers though able men, others are capable lawyers as well as acute men of the world. If these appeals are to go before a Divisional Court it should be carefully composed of judges conspicuous both for common sense and legal knowledge.

Two Important Gas Bills.

Two gas bills of considerable importance to gas consumers in general, and which have already passed the House of Commons, and been discussed in previous issues of the *Builder*, were last week considered by Committees of the House of Lords. The preamble of the South Metropolitan Bill was found proved, subject to the exclusion of the proviso in the transfer clause that "all moneys which the Gas Light and Coke Company shall receive from any Local Authority for public lighting in excess of that which the said Gas Light and Coke Company would have been required to charge but for the transfer of the said undertaking shall be applied to a reduction of the price of gas supplied to the private consumer." The important condition that the South Metropolitan Company shall not be allowed to purchase the property and rights of the Gas Light and Coke Company on the south side of the Thames until the latter company have obtained power from Parliament to raise additional capital, remains in the Bill. The second Bill, known as the Mond Gas Bill, which is to sanction the supply of cheap fuel gas throughout a large area in Staffordshire already supplied with coal gas, was also approved, the preamble being reported proved by the Committee, subject to certain slight alterations being made in the Bill. The Mond scheme is a new departure in gas supply in this country, although in America an attempt to supply cheap low-grade gas for fuel purposes was made some time ago, but did not prove a financial success. Should the Mond scheme meet with success, there is little doubt that throughout the country the public demand for gas of high illuminating power, which is necessarily costly, will be superseded by a demand for cheaper low-grade gas.

Railway Communication with Dalmatia.

ON the 17th inst. a new railway connecting Austria, Bosnia, and Herzegovina with Dalmatia was opened. The new line branches from the Metkovic-Mostar railway near the latter place, and ends near Castelnuovo, in the Bocche di Cattaro. We went over part of the line last autumn, and have no hesitation in saying that it is a triumph of engineering. It passes for the most part through barren, mountainous country, which presented many difficulties. Although the new railway is doubtless primarily intended for strategic purposes, to assist in the fortification of the new Austrian naval arsenal at Teodo, in the Bocche di Cattaro, it will be hailed with great satisfaction by those archæologists and students of the Balkan peninsula who have hitherto been practically compelled to keep to the coast for the want of conveyance, and by others who have had to perform the tedious sea journey from Trieste to Cattaro. Like its new branch line from Hum to Trebinje, this railway will enable Montenegro to be opened up, if ever the independent Montenegrins can be got to assent to it. There is, however, one cause for regret: the Bocche di Cattaro, with the road up the mountains to Cettinje, is one of the most beautiful pieces of scenery in Europe; the "tourist" has already made his appearance; and though the railway through it will fortunately never succeed in climbing the heights to Montenegro, it will popularise the Bocche, and from interesting Dalmatian villages we shall see the places transformed into modern holiday resorts.

Tramway Brakes.

THE problem of the best system of brakes for electric cars is one which has been exercising the ingenuity of inventors for several years. The regulations issued last year by the Paris police show the severity of the tests to which the brakes are subjected. Every car has to be provided with brakes sufficiently powerful to stop it in 20 metres (21·8 yards) on a down gradient of 2 per cent. when running at a speed of 20 kilometres (12·4 miles) per hour. They also stipulate that every car must have two independent brakes acting on all the axles. At the Edinburgh meeting of the Municipal Electrical Association, Mr. Fell, the tramway engineer to the Sheffield Corporation, read a valuable paper on this subject. The main classes of brakes discussed were hand brakes, friction brakes, slipper brakes, pneumatic brakes and electro-magnetic brakes. Slipper brakes are extensively used in England. They consist simply of wood blocks which are pressed down on the rails by means of levers. They are so designed that it is impossible for them to lift the car off the rails. Where there is a steep gradient they, in conjunction with other brakes, are nearly always used. They are specially advantageous on single lines, for the descending car cleans the rails for the ascending one. The electro-magnetic brake is the most powerful. It consists of two cast-iron discs, one of which is fixed to the motor and has a coil of wire wrapped round it, the other is keyed to the axle. On turning the handle the motors act as generators which in itself produces a very powerful retarding force on the car and send a large current through the disc coil. The discs are thus strongly magnetised and put a powerful drag on the axles. The braking action is so strong that the wheels will at once skid unless a plentiful supply of sand is available. Mr. Fell recommends that hand and slipper brakes be ordinarily employed, and that the electro-magnetic brake should be kept for emergencies as the wear and tear caused by it is excessive. Pneumatic brakes were spoken of disparagingly, but they are used successfully in France. In Paris the Compagnie Générale des Omnibus use the following brakes: (1) a pneumatic brake applicable by the driver; (2) an automatic compressed air brake for both driver and conductor; (3) a hand brake for both driver and conductor; and (4) an electro-magnetic emergency brake for the driver. It may fairly be questioned whether this tendency of tramway engineers towards a multiplicity of brakes is advisable. It seems to us that it gives the driver too much to do on an emergency.

An Urban District Pigstye.

DR. WHEATON'S Report to the Local Government Board on the sanitary condition of the Bishop Auckland Urban District reveals a state of things about as bad, in a sanitary sense, as it can well be. Everything seems to be in a bad state—dwellings, roads, water supply, sewerage, and scavenging. There are a number of back-to-back dwellings without means of through ventilation. In the northern and old part of the town there are collections of dilapidated old dwellings fronting the streets, having between them narrow passages leading to courts in their rear. The dwellings fronting the street have been built in a very irregular manner so as to obstruct lighting and ventilation. They have no curtilage, or have only a very small yard approached by a passage. This yard is often almost entirely

filled by a midden privy of the most unwholesome type, often used in common by the inhabitants of two or more dwellings. In other cases the yards are paved with cobble stones, and are often badly drained, so that the water stands in pools after heavy rainfall, and soaks into the ground in the neighbourhood of dwellings. In some yards there are long open channels of cobble stones or brick into which liquid refuse is thrown, and from which a great part of such refuse escapes by percolation into the ground before reaching the gullies in which the channels terminate. The water supply is obtained from the river Wear as it passes the town. The waterworks are the property of the Urban District Council, and date from the year 1856. The water is collected by open-jointed pipes laid in the river bed and conveyed by a collecting pipe to a filter, from which it passes to a well, whence it is pumped by a force-pump driven by turbines to the reservoir in the town. Owing to floods and to the comparatively small capacity of the town reservoir, viz., 375,000 gallons, unfiltered water is from time to time supplied to the town, and the Report adds that there is no doubt that this river is grossly polluted, and that to supply such water in an unfiltered condition is an absolutely unjustifiable proceeding. In regard to sewerage, the Council have not caused plans to be made and kept up, and the position of some of the sewers is in consequence not known to the officers of the Council. Property owners have from time to time connected the drains of new dwellings to the sewers, apparently without supervision. The sewers, which were mainly constructed about the year 1850, have not all a sufficient fall, nor are they laid in straight lines, and in some instances the fall is in the opposite direction to that which was originally intended. The majority of the sewers are constructed of tiles, in a manner which renders them practically identical with what is known as a rubble drain. Excrement disposal is mainly effected by midden privies, and scavenging is performed partly by the District Council, partly by a contractor:—

"The method is most unsatisfactory, and is such as to directly favour the spread of enteric fever. The contents of midden privies having been emptied into the road, street, back street, or yard by men in the employ of the Council, it is the business of the contractor to remove the heaps of filth into carts and convey it out of the district. As the result of this system the ground of the streets, roads, back streets, yards, and passages in the town is polluted by filth, which, owing to the endemic prevalence of the disease in the town, must often contain the infective matters of enteric fever."

We have not space to quote further, but what follows in the Report is still more unpleasant reading. When it is added that the condition of many of the public streets is such that they are almost impassable, while "many of the back streets are sloughs of filth and refuse, mixed with mud many inches in depth," this picture of a market town in the twentieth century becomes delightfully complete.

Sanitary State of Hexham.

DR. E. P. MANBY'S Report to the Local Government Board upon an outbreak of typhus fever in the Urban District of Hexham, states that the town has a good public water supply, derived from springs in the millstone grit at Allendale Common, about ten miles to the south, and the system of sewerage and house drainage appears to be not unsatisfactory. The only part of the town where poor class tenement property prevails is in a small low-lying area adjacent to Gilesgate. In this locality many of the houses are old and crowded together, and typhus fever, if introduced into Hexham, had in this neighbourhood special opportunity for spreading. The most specially unhealthy portion appears to be a block of houses called "The Mystery." This consists of ten houses, side by side; four of them three-story and the remainder two-story. The tenements on the upper two floors of the four large houses are approached from a back yard, unevenly laid with cobble stones except for a paved strip adjoining the houses, and shut in by a 10-ft. brick wall and by other houses, so as to render free circulation of air almost impossible. Through ventilation in some of the houses is also very badly provided for. "The Mystery" was only erected some twenty-four years ago, and it appears that the Medical Officer of Health expressed at that time his disapproval of the plans submitted. If this be so, a heavy responsibility, as Dr. Manby observes, rests on those who allowed the building to proceed.

Hollingbourne, Kent.

THE fine old gabled manor house at Hollingbourne will be offered for sale by auction next week. It stands close by the ancient British road, since known as the Pilgrims' Way, as it passes eastwards from Aylesford along the southern slopes of the north range of chalk downs, overlooking the fertile valley below. It is believed that the manor house occupies the site of one which Athelstan bought from his father, Ethelred II., and bestowed, 980, upon Christ Church, Canterbury, and that the greater part of it, as built by the Colepeper family in the earlier half of the sixteenth century—the north wing has been pulled down—encases the fourteenth century house. The end wall of the Elizabethan hall embodies an Early English doorway. Many of the original features have been preserved, including the oaken doors, panelling, and beam ceilings, the open stone fireplaces with high chimney-pieces and fire-backs, and the six-turn staircase with newels carved in oak, which leads to the gallery, 60 ft. long, and the rooms on the upper floor; an ivy-clad parapet wall encloses the beautiful old garden. In the church, which was restored by Sir G. G. Scott, and for which a new vestry is being built from Mr. W. D. Caröe's designs, are monuments of the Colepepers of Hollingbourne and the neighbouring Leeds Castle. An extension made in the latter half of the fifteenth century of the north aisle has been converted into the "Colepeper" chapel, the floor being raised and the walls faced with flintwork. The name of the parish is said to be derived from the holly trees, which, together with the yews, and the thorns at Detling and Thurnham on the west, mark the track of the now almost deserted Pilgrims' Way, formerly the main road through the South-East of England.

The Allan-Fraser Art College, Arbroath.

THERE will shortly be opened at Hospital-field House, which stands upon the site of the hospice of the Abbey of Arbroath, the Art College endowed by the late Patrick Allan-Fraser. The bequest provides for the gratuitous maintenance and instruction of a limited number of fully qualified students, who do not enjoy private means, in sculpture, architecture, painting, wood-carving, and engraving, landscape-painting, and drawing from the life, during a course of four years, for the cultivation of the home-farm, travelling studentships, lectures upon art and science by outside lecturers, prizes, and kindred benevolences. The trustees have appointed Mr. George Harcourt, of Bushey, as resident governor of the college, for which some studios have been erected, and which is to be opened next October for the reception of Scotch, English, and Irish students who purpose to make art their profession.

The Fine-Art Society's Gallery.

THE Fine-Art Society have on view four oil paintings by Mr. MacWhirter, being views of the Yarrow and Newark Tower; Moray Firth and the Findhorn; the Pass of Killiecrankie; and what in the catalogue is incorrectly called "Ridpath Castle, on the Tweed." There is no such castle; what is painted is the well-known and picturesquely situated Neidpath Castle. This is the finest picture of the four, and has much less of the artist's usual mannerism and signature of the white birch-stem. In the same room are a number of large and powerful water-colour drawings of scenes in Kashmir, by Colonel Strahan, R.E., who we presume must take rank as an amateur, but an amateur of unusual qualifications. These are to some extent topographical pictures; their illustrative quality was perhaps the first consideration; but they give powerful impressions of the barren rocky scenery of the Kashmir ranges, with some studies of native architecture and of Ganges scenery here and there, and make a collection which is well worth a visit. In the middle room is a small collection of etchings, &c., by Mr. Herbert Dicksee, mostly original, some of them after pictures by other artists. The two ploughing scenes, numbered 1 and 2, are among the best of the works, and are finely conceived little pictures, and the studies of tigers and lions are very interesting.

MUNICIPAL BUILDINGS COMPETITION, HEREFORD.

THE designs for the proposed new Municipal Buildings for the City of Hereford were on view to the public on Saturday and Monday last in the Shire Hall. The scheme is not a very extensive one, and forty-six designs have been received, some of which are of very considerable merit.

The site is a good one, and is situated in the wide thoroughfare of St. Owen-street. Some existing buildings are in the rear which it is proposed to retain, and finally to incorporate them with the present proposed scheme. The site has a frontage of 99 ft. by about 180 ft. in depth.

Provision was to be made for an Assembly Hall seating about 400 persons upon the first floor, and to be in the front; the council chamber was also to be on this level, a stipulation being that ample means of egress was to be provided—an important condition which a large number of competitors do not seem to have fully realised.

Three premiums were offered with the usual stipulations, which we think without reason, as to certain limitations in the ultimate choice by the Corporation. We have pointed out before, and it is necessary to do so from time to time, that while premiums are necessary, and should as far as possible be upon a liberal scale, yet architects do not compete for these, for they might be more advantageously employed, but rather for the commission of carrying out the proposed building.

Among the large number of designs hung are some very interesting and pleasing proposals, and it would be possible to indicate several which, with a few modifications in plan and taken all round as architectural compositions, might be esteemed to be far superior to the three premiated designs and to the three further designs "reserved" for consideration by the committee.

The assessor, Mr. Thomas Blashill, has placed first the design under Motto "1,002" (No. 3). The plan is divided by two corridors from front to back. The entrance hall uniting these has the principal staircase; the lavatories behind on a central area, which also lights the corridors. Another entrance hall is provided at the right-hand corner of the front, which gives the second important staircase. Between this entrance and the principal one has been placed the rates office. Whether this is accidental or designed is immaterial; but it meets the local necessities; as in Hereford a discount is allowed on the rates, and a last day comes, and with it a great crowd of ratepayers, so that an entry and exit close on the street are essential. This in the premiated design is fully secured. On the other side of the principal entrance the town clerk has a good room (24 ft. by 19 ft. 9 in.), with his clerks' office, a room 15 ft. 6 in. by 16 ft. 6 in., behind; this room is beneath an archway, and the lighting to it is very bad indeed. The first floor is well and adequately considered; the assembly-room is in front, with the two large staircases affording separate exits. The assembly hall has its platform well contrived, with retiring-rooms and lavatories, and seems to be the only one in the competition with an adequate green-room. The mayor's parlour is placed on the right side, half way between the hall in front and the council chamber behind, his robing-room adjoining the latter apartment and the rooms arranged *en suite*. The authors say that the design has been planned so that the municipal department may be used separately or conjointly with the public.

The architectural character of the design is very indifferent and un-municipal, and may be described as a front with an acute pediment at either end, some pilasters and arches in brick and stone, and a ventilator in the roof. It is unrecognisable as a town hall, and the perspective is a poor production. A plan may be modified and improved, but no amount of tinkering by a draughtsman could make this design appear externally as an adequate building for its purpose, though the plan is not without considerable merit.

The second premium goes to "Camelot" (No. 10). This design also is well arranged in regard to the rates office, but the inspector of nuisances has the best place in front, while the town clerk is pushed to the back, which order should have been reversed. The upper floor is, however, better in arrangement; the hall is in front, the council chamber at the back; the arrangement of seating should be reversed, so that the mayor has easy access thereto. The committee and other rooms on the right are *en suite*. The front is of Bath stone, in what, for lack of a better term, may be called erratic Ionic, the desire, according to the report, being to get a "well balanced composition, worthy of a town which contains such a beautiful cathedral"—a proper aspiration, which we regret the elevations do not exemplify. The perspective does not improve the qualities of the design.

The third premiated design is that signed "Hope" (No. 7). The design has good points in the plan, not unlike the first; the elevations are in black and white and are very uninteresting; an elaborate perspective is shown in hot yellow stone or terra-cotta. The general character of the design, with segmental arches and small ornamental turrets, is of a type which was popular thirty years or more ago. The small sketch perspective of the staircase might well have been omitted.

The next three designs to be noted are those "reserved for consideration." Of these, No. 21 (photo of perspective on report) has a powerful sepia perspective which seemed to attract considerable admiration, and one instinctively was reminded of that assessor who, once upon a time, on entering the room filled with drawings, said, with horror, "Please cover up all the perspectives with brown paper." It undoubtedly suggests what it is—too much so, perchance; his municipal type, the author "is of opinion, would equal that of any other edifice in the county." The plan is not, however, without good points. The staircase is a semicircle on plan in the centre, the council chamber is up three flights, and the surveyor placed on a mezzanine. The sections are poorly rendered and the decoration has a cheap appearance, but the whole get-up betokens competition fever haste.

The second "reserved" design is "Simplicity" (No. 28). We confess our inability to see any reason for this design to be reserved, and we venture to think that lack of both knowledge and experience of the subject is shown in the plan. The front is composed of curved bows, a porch extends right over the pavement, the great columns of which have no entasis, while the columns of the inner arch have an exuberant bulge. The perspective is the best part of "Simplicity's" exhibition on nine strainers.

The remaining reserved design is that under the motto "Fortis in arduis" (No. 29). The interior of the plan is well lighted, but there is little evidence of scientific study; the drawings are in sepia line and of indifferent character; the front, an elaborate terra-cotta one, is seen to better advantage in the ink line perspective.

We turn now to some of the more interesting designs exhibited. The one distinguished by the device of a rose in a square is a fine design and a good plan, which, although possessing great merit, is not entirely free from defects. The centre of the building is occupied by a court, 40 ft. by 27 ft., with two staircases, one on either side; but, as far as exit is concerned, these meet. The rates office is at the rear, and but slight modification would be necessary to make this amenable to local usage. To an orderly plan is added a dignified elevation, monumental and municipal in character. The design is for execution in stone and is Classical in type, and the author is to be heartily congratulated upon the general refinement of character in the whole work. The assembly room is well marked externally by long windows and the Ionic order. The gabled window to the left is heavy in detail, and the figures in the curved pediment have a rather crowded and uncomfortable look. This design, however, is in the main of a high order, and is well illustrated by a fine perspective view coloured by Mr. J. J. Joass.

Another very interesting design is that by "Quex," which has many excellent points. The building is somewhat sacrificed to a fine loggia, the wings are kept down and are masked by great plain ramps; the first floor has a series of pedimented windows, the architraves looking somewhat thin. Between these windows upon the red brick wall are large pendant bunches of foliage, rather out of scale with the other detail. The detail of the sections is too elaborate for the cost. The design is somewhat overweighted by the roof turret. The draughtsmanship is excellent, with some fine, vigorous, figure sculpture; the elevations are projected in shadow. There is one of the most brilliantly-executed perspectives in pencil and colour we have seen of late years.

"Civic" is a commendable effort by a local firm; the plan, however, is not fully considered. The elevations are of a florid Renaissance character, inked in and touched up with charcoal. The large perspective is a characteristic piece of work, executed with soft pencil, and has a rather woolly effect. The sections are very undesirable in detail.

The plan of "English Renaissance" shows the principal entrance at the side; a single corridor runs from front to back. The front elevation is a decided success, well-balanced and broad, with rustic base, corniced windows to the first floor, with curved pediments over, surmounted by entablature and balustrade. The drawings are well executed, but the perspective does not do the design justice.

"Hiram" has the most pretentious production in the exhibition, with good elements in the plan. The front is flanked by curved pediments, and the centre crowned with a young "Oratory" dome. The perspective, in pencil, does not benefit the design much.

"4,321" is a very able and compact design, economical in lay out, and with knowledge of working. A fine, vigorous perspective in colour is shown; the defect seems to be want of sufficient consideration of exits, as but one public staircase is provided. The elevations are in a pleasing yet simple and thoroughly English style. The front elevation is divided up by grooved stone piers enclosing circular-headed windows to the assembly-room, the ground story being divided in each of these bays into three compartments by Doric columns. The central feature is a pediment and coupled Ionic pilasters, a magnificent projecting clock, and a very picturesque balcony over the columned entrance. The roof is overweighted by a great turret, and the chimnies are grouped at either end. Dignity without elaboration has been thoroughly attained, and the whole looks what it is meant for—a town hall for a cathedral town. The drawings are of a high order of excellence.

"Red Star" is an elaborate and expensive proposal, with plenty of carved friezes and without either restraint or repose. The plan has many extravagant features. This is a very contrived effort, and, looking at this and others, it is wonderful to think to what lengths ingenuity without purpose will go.

"Halfpenny Stamp in Circle." Entrances are provided on either side. The front has pediments at the ends with finnicking figure friezes, but the whole composition requires tying together and shows to better advantage in the monochrome perspective. The character of the back elevation is, however, distinctly interesting.

"One in Green Wreath." This is a very able design, with an excellent plan in which all the difficulties seem to have been met—a fine dignified staircase, with an ample second staircase, for the assembly hall, other smaller staircases being conveniently disposed to give abundant access. The rates office is at the side close to an entrance, and a lobby would make this fully meet the local uses. The elevation is dignified and restrained—Renaissance without fussiness. The façade occupies the whole frontage, with large arches at either end. The whole design would altogether make a very satisfactory building, as it thoroughly, by its plan and elevation, expresses its purpose. A pencil and wash perspective is shown.

"Utility" has an excellent plan marred by inattention to exits. The front elevation shows a broad and dignified treatment, but the façade is broken rather by the entrance not being in the centre, and this is emphasised by a curved pediment above it and a clock, the remaining portion of the front being treated in a different manner. The drawings are excellent and show considerable skill, and there is a fine, freely executed perspective, strongly shown in pencil and tinted in lamp black, the whole being thoroughly municipal in character. This is, as far as we observed, the only design with isolated lavatories on the outside.

"Architecto" has a hot colour scheme on the plans, in vivid contrast to the plain, thick ink lines of the elevations and sections. This shows the plans and scheme at a glance, which has been well and architecturally considered. The principal elevation is a heavy lined drawing, and looks like a magnified plate out of "Vitruvius Britannicus." The perspective, which is a large one, is in ink and of up-to-date manner, but does not better the elevation in character; the sections are very suitably treated. "Architecto" has a firm hand in the printing line, as some of his down strokes are quite a quarter of an inch wide.

Among the remaining sets, "Ionic" may be mentioned as a civic-looking design somewhat in the manner of Colchester, of a monumental character and shown in a fine water-colour perspective. "Mercia" looks like a Venetian palace flanked by two great flag posts; the drawings are very good and complete and full of suggestion. "Hereford" shows some good and pleasing work, but he has put the assembly hall at the rear; the elevations have merit, and there is a fine line perspective. "A.D. 1901" is the only competitor who has ventured on a tower, which was not asked for; but the design has an important appearance. "Coningsby," "Rex" and "Wye," are designs which show good points.

It is worth note, as an instance of the manner in which competitions are gone into now, that as many as six perspectives are, if we mistake not, from the hand of one draughtsman.

The awards in this competition we cannot profess to understand, and it is not surprising that they seem to have excited both surprise and anger among some of the competitors. The selection by the Corporation of three other designs, with the view of considering them as in opposition to those selected by the assessor, is a most irregular proceeding. The whole thing appears to have been much mismanaged, and the best designs, in an archi-

tectural sense, to have been entirely passed over, both in the premiated and "reserved" list.

Since the above notice was written, we have received the following list of the names of the authors of the premiated and "reserved" designs :—

First premium : Messrs. Macintosh & Newman (London).

Second premium : Mr. H. T. Fowler (Barrow-in-Furness).

Third premium : Mr. G. H. Stanger (Wolverhampton).

The three "reserved" designs are by Mr. H. T. Cheers (Twickenham) ; Messrs. James Brooks, Son & Godsell, (London) ; and Messrs. W. J. Morley & Son (Bradford).

GLASGOW INTERNATIONAL EXHIBITION.

SANITARY FITTINGS, &c.

THE sanitary exhibits at the Glasgow Exhibition are scattered throughout various parts of the Industrial Hall, Grand Avenue, Machinery Hall, and in some of the detached pavilions, and are therefore not to be found without some difficulty. The most important group is in the south-east court of the Industrial Hall, and merits first attention. At stand No. 80 a working model of the Septic Tank system of sewage treatment is shown, including a new automatic alternating gear for the filters. We have already described the principal features of this system and need only draw our readers' attention to the small pamphlet (which can be obtained at the stand), containing numerous photographs of installations for towns, barracks, private houses, and other buildings.

The next exhibit (No. 81) is that of Messrs. Shanks & Co., and consists of sanitary fittings and model bathrooms. Among the lavatories we noticed one with a porcelain basin and a beautiful Mexican onyx slab, and another, known as the "Treviso," with the basin and top in one piece of porcelain, the top being oval-fronted and supported on a simple framework of round nickel-plated brass tubes. In both these fittings the new "Perfecto" siphonic waste is used. This appears to be an admirable contrivance, but we had not the opportunity of seeing it in action. It consists of a tube with a metal flange about 1½ in. from the bottom, the flange having a rubber collar under it to seat tightly against the circular pottery outlet of the basin. This outlet is flanged at the bottom, so that a lead or brass trap with flanged inlet can be bolted to it. The tube forms a standing waste and overflow, but differs from the ordinary arrangement in having an inverted cup or dome over the top, with a small airhole through the crown. This cup forms with the tube a siphon of the dome type, and if the taps are left running when the waste is closed, the water rises to the top of the tube and overflows in the ordinary way; but if the supply is greater than the overflow can thus discharge, the water continues to rise in the basin till a sufficient head is obtained to start siphonic action ; this rapidly discharges the water down to the normal level. The tube is fitted to the back of the basin in a simple manner, and can be easily removed. The same form of waste and overflow, but on a larger scale, is fitted to a white porcelain-enamelled iron bath. Excellent baths of vitreous-enamelled iron and porcelain-enamelled fireclay are also shown. The fireclay baths are decorated outside, and one of them has a combined supply fitting, operated by a handle, which can be turned around a dial-plate from "shut" to "cold," "tepid," and "hot." Cold water must therefore be turned on first. The valves are non-concussive, and the fitting is well adapted for public baths and other buildings. In one of the model bathrooms an iron plunge-bath with white enamelled zinc hood is shown. The body of the bath has a wide roll of ordinary shape, but around the foot of the bath a splay takes the place of the roll, and the hood is fixed within the splay in such a manner that there is a clear space between the hood and the bath, while splashing is prevented. In the other bathroom there is, in addition to a porcelain plunge-bath, a tubular needle-bath (comprising wave, spray, and shower) fixed on a dished marble slab with brass outlet-grate. In this bathroom there is also a lavatory basin with an oval white marble slab standing clear of the wall. Among the sinks we noticed a butler's sink of white glazed fireclay with two compartments, fitted with simple standing wastes and overflows, which can be easily removed. Water-closets of the wash-down and siphonic types are shown ; one of the latter has a three-gallon flushing cistern fixed immediately above the seat, the cistern having a floating valve and 3-in. outlet. The "Aqua-jet" cistern is a siphonic cistern of novel type, requiring a remarkably gentle pull and being almost noiseless in action ; for fixing immediately above the basin, it is made to hold three gallons, and has a 2¾-in. outlet. Among the other fittings are an enamelled iron sitz bath, a bidet, towel rails, and other bathroom accessories. The simpler of the two model bathrooms has a mosaic floor and tiled walls, and the more elaborate has the walls faced with slabs of white statuary marble with dividing strips and frieze of light greenish marble, the frieze having a key border of Venetian gold mosaic. The exhibit, taken as a whole, is most interesting, and well worthy of the reputation of the firm. Messrs. Shanks & Co. have generously fitted up all the lavatories, urinals, and water-closets throughout the Exhibition and grounds, as well as the lavatories in the Royal Reception Rooms. These fittings are of various types, and are well worthy of inspection, as they can be seen in actual use.

At the next stand (No. 82) Messrs. Charles Buick & Sons, of Alloa, have a varied assortment of sanitary fittings, drain-pipes and traps, terra-cotta ridges and finials, flower-pots, &c. Perhaps the most notable fitting is a range of stall-urinals in amber glazed fireclay ; each stall has the base, curved back, and perforated flushing-rim in one piece. The front pillars and capping are of white glazed fireclay. Another range is on similar lines, but with white glazed stalls and marbled pillars and capping. We noticed also a good flushing-rim slop-hopper with back and sides 16 in. high to prevent splashing, and a range of three school lavatories bolted together so that two pedestals serve for the three basins ; the basins have rubber waste-plugs and large overflows protected with nickel-plated brass grates, each of which can be removed after taking out one screw. Among the other fittings are a siphonic water-closet, a large white glazed fluted mortuary slab, three wash-tubs, and three enamelled fireclay baths, one of these having a side outlet.

Messrs. Doulton & Co. have a large and interesting exhibit of faïence, sanitary fittings, glazed-ware fireplaces, tiles, &c., at stand 83. The baths include vitreous-enamelled cast-iron plunge and sitz baths, nickel-plated tubular bath comprising wave, spray, and shower, and fixed on a vitreous-enamelled iron dish, and a plunge bath with hood for spray and shower. These are all well made with smooth and perfect surfaces, but do not possess any particularly novel features. The asylum bath fittings with special regulator to avoid scalding are decidedly ingenious. The valves are non-concussive, and are operated by a loose key which can be fitted on the end of the spindle passing between the valves. From this spindle two levers or arms project over the press-buttons on the tops of the valves and work on eccentrics in such a manner that as the key is turned one lever is gradually depressed on to the cold valve, thus starting the cold supply ; a further turn of the key brings the second lever down on to the hot valve, so that tepid water is supplied ; and as the turning of the key proceeds, the hot lever is gradually depressed still more, while the cold lever is gradually withdrawn, so that at last only hot water is supplied. The fitting works very smoothly and is well made ; it is protected by a metal case with a key-hole opposite the spindle. A somewhat new departure is the employment of cast-iron for wash-tubs ; one of these finished with white vitreous-enamel measures 2 ft. 11 in. by 2 ft. 1 in. by 16 in., and has a 2-in. vulcanite plug, loose vitreous-enamelled iron back 11 in. high, and enamelled-iron supports. There is also a neat porcelain lavatory with basin, top, back, elbows and frieze in one piece, and supported on T-iron brackets concealed by the side friezes ; it measures 27 in. by 19 in. and has a vulcanite plug and open-top overflow protected by a hinged grate. A massive lavatory in white glazed fireclay, supported on enamelled iron legs, appears to be almost unbreakable ; it has an open-top overflow and safety-plug, and is fitted with a loose back of white glazed fireclay. A strong oval-fronted operating lavatory in glazed fireclay measures 2 ft. 7 in. by 2 ft., and has an open-top overflow and treadles for the hot and cold supplies. The most elaborate lavatory has an onyx slab and back, and nickel-plated legs, and is a very satisfactory piece of work. Stall urinals in glazed ware, and others in glazed ware and marble, are shown, with distributing nozzles for the flush.

A range of siphonic trough-closets is fitted with a small chamber containing a float-valve, which rises with the usage of the closets and ultimately starts the siphonic action of the flushing cistern. The recurrence of the flush is thus automatically controlled by the usage of the closets. Strong stoneware wash-down closets for factories, &c., are shown, and valve and siphonic closets for buildings of a better class. The valve-closet has a marble seat and enclosure, and the flush is actuated by a press-button (push and let go). One of the siphonic closets has a similar press-button, the flush being obtained through a regulating valve instead of the usual cistern. The latest type of hospital bed-pan sink, known as the "St. Thomas," is a well-designed fitting of massive character. It measures 21 in. by 16 in. inside the flushing rim, and is supported on a simple enamelled cast-iron bracket (shaped like a man-hole step), the ends of which are built into the wall. The hopper has a flanged outlet, to which a P-trap is bolted, and the trap has a lead socket on the outlet for connexion to the lead soil-pipe. The bedpans can be cleansed by means of a jet worked by a treadle, and the same action starts the flushing apparatus, so that the contents of the pans are at once removed. There is also a slop-hopper suitable for houses and hotels ; a brass grating is ingeniously contrived to protect the front roll, and is hinged so that both grating and roll can be thoroughly cleaned. The hopper has a pottery outlet-grid, and above this is a large loose brass grating with rubber buffers which serves as a stand for utensils which are being washed or filled with water.

The last stand in this group is No. 84, and is occupied by the large exhibit of Messrs. Twyford, Limited, of Hanley. One of the most conspicuous objects is a three-compartment sink in one piece of enamelled fireclay, measuring 7 ft. 4½ in. by 2 ft. by 15 in. deep, the back being 9 in. higher. This is a fine example of the potter's skill. The "Ruchil" sink, used in the Ruchil Hospital at Glasgow, is of fireclay white-enamelled inside and outside (except underneath), and supported on pedestals of the same material. The "Brentford" slop-hopper and sink is in one piece of enamelled fireclay, but the hopper is only 9¾ in. in diameter inside the flushing rim. The new form of the "Middlesex slop bed-pan and scalding sink" for hospitals is made in one piece (instead of two as formerly), and measures 4 ft. 3 in. by 22½ in. ; the hopper has a perforated flushing rim and the sink has a simple gun-metal lift-out standing waste and overflow. The "Birmingham" slop hopper and drainer is also in one piece, but of simpler design, a draining slab taking the place of the scalding sink. The hopper is square at the top, and has a circular brass grate at the outlet ; a pipe rises from the slab and curves over the hopper to form a bedpan nozzle. A slop-hopper for houses has a perforated flushing-rim, brass outlet grate, hinged brass grating with rubber buffers (for supporting utensils), and an inserted wood rim along the front. A group of four lavatories arranged in the form of a square forms an excellent independent fitting ; a shower-rose is attached to a pipe rising from the centre and swivelled so that the shower can be turned over each basin. The "Hydro" is a new form of lavatory standing waste, somewhat similar to this firm's "Neros" waste, but fixed clear of the back of the basin. An enamelled fireclay bath with ridged bottom (to prevent slipping) is also shown ; it has a wood rim along the front, and a shelf along the back in one piece with the bath. Among the bath-fittings we noticed a set for asylums, so arranged that the hot spindle is covered until the cold spindle has been turned, and also a set of fittings with mixing chamber and thermometer for regulating the temperature of the water. The firm's well-known siphonic closet is shown, and we noticed also a "detachable" closet outlet joint ; in this joint a brass collar (screwed outside) is attached to the pottery outlet of the closet, and the joint is completed by a brass union and tail-pipe after the manner of the ordinary lavatory unions.

"Adamant" urinals in straight and hexagonal ranges are also shown, together with a new design, in which the base, back, front pillars, and capping are in one piece of glazed fireclay, measuring 5 ft. 6 in. by 2 ft. 6 in. by 1 ft. 9 in. A horizontal groove is formed around the curved back for the reception of the copper sparge pipe, which is fixed by a single nut in the centre.

The next important exhibit of sanitary fittings will be found at Stand 85 on the right-hand side of the Grand Avenue, and is owned by Messrs. T. B. Campbell & Sons, of Glasgow. The principal feature is a bath-room suite made by the Standard Sanitary Manufacturing Co., of Pittsburg, U.S.A. Two baths are shown —plunge and sitz—both being of white-enamelled cast-iron, excellently finished; the lavatory basin is of porcelain, and has an oval white marble slab 2 in. thick with roll edge and dished around the basin; the combined waste-and-overflow is of the standing type and is placed in a metal cylinder behind the basin. The siphonic water-closet has a jet in the bottom of the basin after the manner of Twyford's siphonic closet, and the cistern is placed immediately above the seat and is started by pressing a button; the cistern is of white glazed pottery, with marble top, and the closet seat and lid are of wood enamelled white with good effect. Cassels's patent "Clarifont" lavatories are of Scottish manufacture, and are well adapted for schools. They are of the constant-stream type, and basins in ranges can be supplied with water, either separately or simultaneously. For separate supply the water issues from the tap or taps into a small compartment at the back of the slab, from which it rises into a shallow circular bowl in the centre and overflows thence into a channel between the bowl and the rim of the slab. The water escapes from the channel through a grid into a conduit passing under the central bowl to the waste-outlet under the small inlet compartment. An indiarubber ball plug is used to close the bottom of the inlet compartment when the basin is in use. A slightly different arrangement is adopted for ranges, the channels of the several basins communicating with each other, so that one waste-pipe serves for the whole range. The basins are made in enamelled fireclay or cast-iron, and in various sizes. Other designs than those described are now made, but all have the same inner basin with the water welling up from the bottom, and carrying away the soap and dirt immediately and continuously. Among the other exhibits at this stand are a stack of lead pipes from ⅛ in. to 8 in. in diameter, and a number of taps and other fittings in brass, copper, German silver, &c. Sheets of "Mezzotile"—white enamelled zinc—are used for lining the walls and ceiling of the American bathroom, and have a smooth, hard, and clean surface, practically free from joints.

Messrs. W. Stevenson & Co., of Glasgow have a good display of brass, copper, and drawn-lead pipes at Stand No. 86, and at No. 87 the Bourtrechill Coal Company has a very good miscellaneous assortment of drain-pipes and traps, sinks, garden vases, terra-cotta statues, and other burnt-clay goods. Hutchison's patent drain-pipe has a double socket, the inner one being eccentric to the pipe and having the invert at such a level as to bring the invert of the spigot-pipe resting on it to exactly the same level as that of the socketed pipe. Peddie's "Special" drain-pipe has a large tapering socket, so designed that when the pipes are pushed home they are exactly concentric. The socket for a 4-in. pipe is 3 in. deep, 7¼ in. internal diameter at the outer end, and 5½ in. at the inner. Egg-shaped pipes are also shown. All the pipes are brushed over inside with some composition before firing in the salt-glazing kiln, the result being a greenish-yellow glaze of great smoothness. Among the other sanitary exhibits are the "Turret" and Fulton's grease-traps, Armstrong's "Tron" inspection-junctions, and white glazed manhole channels.

At No. 88 Mr. Wm. Sturrock, of Glasgow, shows manhole-covers, pipe-joints, gullies,-&c., manufactured by the Ames Crosta Sanitary Engineering Company. Some good drain-pipes from 4 in. to 24 in. in diameter are shown at No. 89 by the Glenboig Union Fireclay Company, Limited; the pipes are of a dark purple-brown colour and are true in shape. The Gartcraig Fireclay Company has (among other goods at No. 90) a small exhibit of drain-pipes, and at the next stand Messrs. Peter & Mark Hurll show some drain-pipes, traps, and sinks of ordinary forms, and a fireclay siege-block for a plate-glass furnace, weighing 19¾ cwt., and said to be the largest solid block ever made in Great Britain. In the main avenue of the Industrial Hall two stands (Nos. 185 and 186) are occupied by exhibits of sheet-lead, lead pipes, &c., made by Messrs. Locke, Blackett, & Co. of Newcastle-on-Tyne, and Messrs. Alexander Fergusson & Co., of Glasgow, respectively; the latter firm has the more imposing display.

In the Machinery Hall one of the most important sanitary exhibits is that of Messrs. Mather & Platt, Limited, Manchester, at No. 610. Reeves's patent "single constant pressure filter" and "compound gravity filter" are shown, and are suitable for town and village supplies, and also for mansions and factories. The filtering material is pure quartz sand suitably graded, and simple arrangements are adopted for cleansing this. The gravity system is recommended for domestic purposes, and appears to have given good results at many places in this and other countries. A model of filter-beds for sewage with a special distributing apparatus is also shown. Other sanitary exhibits in the Machinery Hall which deserve at least passing mention are the following:—No. 431 (Messrs. Glenfield & Kennedy, Limited, Kilmarnock), penstocks and flap-valves for sewers, including a penstock for an oval sewer 36 in. by 24 in., with worm gearing and balance weight, and an ingenious apparatus for cleaning water-mains without disturbing the pipes except at certain points; No. 470 (Messrs. F. Braby & Co.), copper boilers, galvanised iron cisterns, &c.; No. 523 (Messrs. McDowall, Steven, & Co., Ltd., Glasgow), enamelled iron baths, porcelain lavatories, and glass-enamelled iron bends for drains; No. 527 (Messrs. Stewart & Menzies, Ltd., Glasgow), iron and steel pipes, and a 4-in. inscribed Roman seamed lead pipe of the first century with a joint like a modern copper-bit joint; No. 530 (Muntz Metal Co., Ltd., Birmingham), drawn copper, brass, and Muntz's metal tubes, coils, rods, bolts, &c.; No. 555 (Messrs. Thos. Bradford & Co., Manchester), laundry machinery and fittings for public and private laundries, and cooking and bathing appliances; No. 570 (Messrs. J. Stott & Co., Oldham), water-heaters for public and private baths; No. 584 (Messrs. D. & J. Tullis, Limited, Clydebank) and No. 601 (Mr. James Ritchie), laundry machinery and fittings of various kinds. At No. 519 Messrs. Walter Macfarlane & Co. have an excellent exhibit of glass-enamelled cast-iron drain-pipes and traps, all cut in half longitudinally and fitted together, so that the metal and glaze can be thoroughly examined. There is a 3-in. trap with junction and grate at one end of the drain, followed by a 3-in. to 4½-in. increasing pipe, after which 4½-in. pipes are fitted and three different traps of the same size, one of these being designed for a brick inspection chamber and another for fixing under an inspection cover in the iron drain. The metal is about ⅜ in. thick and is perfectly sound, and the glaze is smooth and flawless.

Stable fittings merit a short notice. Messrs. Walter Macfarlane & Co. show at stand No. 519 two stalls, one having blue-grey tiles at the head and the other sheet-iron enamelled to imitate marble. The fittings are of porcelain enamelled cast-iron, the drinking-trough in one stall being pivoted like a tip-up lavatory basin. The floor of one stall has an iron channel and grate of ordinary type, while the other has an iron floor-plate 5 in. wide with a groove ⅝ in. wide and about ⅝ in. deep along the middle. The "ornamental" cast-iron work in the upper part of one of the stalls, with a galloping horse in it, had better have been omitted, and would prejudice many persons against the work. This might have passed as artistic cast-iron work thirty years ago, but architects (and even some of their clients) have got beyond this kind of thing now. Plain but good workmanship is preferable to bad ornament, more especially in practical constructions of this class. The same firm has fitted up the stables and cowhouse in the Model Farm Buildings (No. 12) erected in the grounds by Messrs. Speirs & Co., of Glasgow; these are of a strong, plain character as befits their situation. At stand No. 523 in the Machinery Hall, Messrs. McDowall, Steven, & Co., Limited, Glasgow, exhibit a good range consisting of two stalls and a loose-box with porcelain-enamelled iron fittings (including tip-up drinking-trough), hard-grooved buff paving-bricks, iron floor-grates, and greenish-grey tiles at the heads of the stalls. At No. 80 in the Irish Pavilion Messrs. Musgrave & Co. exhibit a model of a range of three stalls and two loose boxes. The Carron Company's exhibit is No. 909 in the Lighting and Heating Pavilion, and includes two stalls paved with adamantine clinkers and iron floor-grates and channels; one stall is fitted with three porcelain enamelled iron pots with a polished bronze top and front roll in one piece. A silent tying chain is shown, the special feature being that the ring which slides up and down the metal rod fixed under the manger is of leather instead of metal. Teak boarding is used in one of the stall-divisions.

The Carron Company also exhibits at the same stand some cast-iron baths, porcelain enamelled and metallic enamelled, of good quality, but without any novel features. At No. 895, in the Lighting and Heating Pavilion, Messrs. Thos. Robertson & Co., of Glasgow, show their bath-heaters; these are rectangular, and therefore different from the usual type of geyser. In the same pavilion there are also several exhibits of gas water-heaters, including those of Messrs. Wilsons & Mathiesons, Dobbie, Forbes & Co., and Fletcher, Russell, & Co. On the second floor of the art galleries some of the exhibits illustrating "Technical Education" will be of interest to plumbers, showing what is being done by students in Glasgow and London.

BRITISH ASSOCIATION OF WATER-WORKS' ENGINEERS.

THE sixth annual conference of the British Association of Waterworks' Engineers has just been held in Birkenhead. The conference was to have spread over four days, the mornings of the first three being occupied with business and the discussion of papers, while the afternoons and the whole of the fourth day were to have been devoted to visits to various water pumping-stations and other places likely to interest the visitors. The headquarters of the Association were at the Birkenhead Town Hall. The members were received on the 9th inst. by the Mayor (Alderman Thomas Cook), who extended a cordial welcome to the visitors. The retiring President, Mr. C. H. Priestley (Cardiff), proposed a vote of thanks to the Mayor. Mr. Watts (Sheffield) seconded the motion, which was carried.

The retiring President then introduced the President-elect, Mr. W. A. Richardson, M.Inst.C.E., Waterworks Engineer to the Corporation of Birkenhead.

The new President, on taking the chair, thanked the Association for the honour conferred upon him, and moved a vote of thanks to Mr. Priestley for his services as President during the past year. This was seconded by Mr. Swindlehurst (Bolton) and adopted.

Mr. Priestley having responded, the President delivered an inaugural address, which embraced a detailed description of the water-works of Birkenhead. He pointed out that Birkenhead is wholly dependent for its water supply upon deep wells sunk in the red sandstone of the district. There are five pumping-stations—Spring Hill, Flaybrick Hill, Borough-road, the Ford, and Mount-road. The last-named works are in progress, and pumping operations are about to be commenced to test the yield of the bore-hole. Spring Hill works were opened in 1841, and subsequently passed through the hands of the Birkenhead Improvement Commissioners to the Birkenhead Corporation, coming under the control of Mr. Richardson when he was appointed Water Engineer to the Corporation in December, 1881. At various dates the bore-holes were deepened, and now the yield is 8,500,000 gallons per week. There are seven shafts (six being 5 ft. diameter) and eight bore-holes from 3 in. to 18 in. diameter, the deepest being 678 ft. below the surface; and a covered service reservoir with a capacity of 800,000 gallons. The Flaybrick Hill works date from 1861, and in 1881 the yield was 14½ million gallons per week, but this by 1891 had decreased to 7,000,000. However, by sinking a borehole 700 ft., the yield had been increased to 8,000,000 gallons per week. At Flaybrick there is a large covered service reservoir, with a capacity of 4,562,600 gallons, and a 50 ft. tower and tank, the latter carrying 104,000 gallons. The Borough-road works also date from 1861, at which time Mr. Richardson was the resident engineer there. The original yield was 2½ million gallons per week, but by lowering the

well from time to time the supply was increased to 10,000,000 gallons in 1893; but in 1897 the yield had fallen to 8,000,000, and at present is 6,000,000 gallons per week. There are here two covered reservoirs and a tank, with a total capacity of 1,557,242 gallons. The Ford borehole was completed in 1896, and an old horizontal engine and pumps working at full capacity yielded at the rate of 9,500,000 gallons per week, lowering the water 145 ft. Air-lift pumping plant in duplicate is being put in position, each set capable of lifting 45,000 gallons per hour, and the first set is expected to be at work in August. At Mount-road a borehole 850 ft. deep was completed last year, but the yield has not been ascertained. Birkenhead supplies a population of 108,721, with an average daily pumping over a period of ten years of 2,637,000 gallons. Wallasey supplies a population of 51,000, with 1,394,471 gallons; Hoylake and West Kirby a population of 12,000, with 386,300 gallons; Neston a population of 4,000, with 82,192 gallons; the Mersey Tunnel pumps 2,400,000 gallons (about one-third being fresh water); and the Wirral and West Cheshire Company supplies a population of 32,100, with 953,884 gallons. Thus within an area of 25,167 acres in that part of Wirral 207,800 people and all trade requirements are supplied with water pumped from the new red sandstone from the wells and boreholes at the rate of 7,853,840 gallons per day, or 54,976,880 gallons per week.—On the motion of Mr. Hamlet Roberts (Ipswich), seconded by Mr. Saintey (Windsor), a vote of thanks was accorded to the President for his address.

Messrs. W. J. Ware (Maidstone) and J. W. Lewis (Farnham) were elected auditors for the ensuing year, and the President announced the results of ballot for new members and associates.

Mr. W. E. Plummer, astronomer to the Mersey Docks and Harbour Board, then contributed a lecture on "Rainfall, the Cycle of Precipitation." A vote of thanks was passed to Mr. Plummer, on the proposition of the President, seconded by Mr. Whittaker (Croydon).

Subsequently the visitors were entertained by the Birkenhead Corporation Gas and Water Committee to luncheon, served in the Mayor's rooms.

During the afternoon the visitors were conveyed in waggonettes on a tour, which embraced visits to the Borough-road, Spring-hill, and the Flaybrick pumping stations. Leaving Flaybrick, the party visited Bidston Observatory, and then crossed the Wallasey Pool Bridge and inspected the Poulton and Liscard pumping stations of the Wallasey District Council, thence driving back to the Birkenhead Town Hall.

On the 10th inst., the first business was the reading of a paper by Mr. William Watts, M.Inst.M. and M.E., F.G.S. (Sheffield), on "Detecting and Preventing the Pollution of Public Water Supplies," which we print on this page.

The President opened a discussion on the paper, condemning iron pipes because of the corrosion which took place, and recommending the use of lead pipes for domestic supply. Mr. D. M. F. Gaskin (Liverpool) also condemned the use of iron pipes, observing, however, that water engineers ought not always to be judged by results, as in many cases they were bound to do what their corporations thought to be cheapest. Mr. Priestley (Cardiff) agreed generally with the paper, except as regards the use of iron pipes, believing lead pipes were better and safer. He said most towns were miserably provided with storage accommodation. Mr. Price (Worcester) urged that it would be cheaper to filter the water in the town rather than to buy up large areas of gathering ground, which might possibly be contaminated. Mr. C. E. Jones (Leyton, Essex) said it had been proved in the Thames Valley that flood water was not nearly so polluted as the normal flow, and, as for iron pipes, they were a nuisance in a thousand ways. Lead pipe with a tin lining was an ideal pipe for house service, but it was not popular on account of its expense.—Several others contributed to the discussion, general dissent being expressed to the use of iron pipes for house services.—In reply, Mr. Watts said he was not in favour of iron pipes if they could get a metal proof against the solvent power of water causing lead poisoning, and he hoped some such metal would be introduced.—On the motion of the President, seconded by Mr. Priestley (Cardiff), a hearty vote of thanks was accorded to Mr. Watts for his paper.

The conference would have been resumed on the 11th inst., but owing to the fire which occurred the previous night at the town-hall, it was decided to abandon the sitting. Before rising on Wednesday, Mr. William Ingham, Waterworks Engineer of Torquay, read a paper on "The Design, Construction, and Cost of Service Reservoirs," and the discussion upon this was adjourned and also the reading of a paper by Mr. A. G. Cloake, of London, on "The French Practice in the Manufacture of Cast-Iron Pipes."

Mr. Ingham, in the course of his paper, explained that he had been collecting the materials for it for some years. The chief points to be considered in connexion with the design of service reservoirs were: (1) the greatest daily variation in the supply; (2) the length of time necessary to repair any defect either in the trunk main, pumping engine, or other machinery between the storage reservoir or well and the service reservoir; (3) the maximum requirements in case of fire or the bursting of water pipes, as in 1895, due to frost; and (4) utilising the reservoir to equalise the variation due to intermittent pumping. Where there was only a single main for the storage to the service reservoir the latter should be large enough to supply the district for from three to four days—if in duplicate from one to two days' supply would be found sufficient. For pumping schemes where the machinery was duplicated a two days' supply was generally sufficient. The depth of the service reservoirs was generally between 9 ft. and 18 ft., the most economical depth, considering all things, probably being within the limits of 12 ft. and 14 ft. For covered reservoirs the economical depth to be excavated under the original surface of the ground might be taken at from 50 to 60 per cent., and for open ones at from 45 to 50 per cent. of the height of the wall. If the soil could be excavated by machinery it would pay to do it if the quantity exceeded 30,000 cubic yards, the cost then being from 9d. to 1s. per yard. Mr. Ingham proceeded to discuss the question of reservoir fittings and the materials used in constructing service reservoirs, and remarked that where coal, salt, or other mines were worked, special attention should be directed to possible disturbances due to their presence. The covering of reservoirs, he said, was a matter upon which there was much difference of opinion amongst engineers and the medical profession. Whether there was any necessity for covering them depended upon the character of the water and the purity of the atmosphere in the neighbourhood. Generally speaking, it would be found necessary to cover all reservoirs wherein hard waters were stored, but in some instances only where soft waters were stored, though in large manufacturing districts it might be necessary to cover them, whether the water be hard or soft. As to the cost, he submitted that circular reservoirs were from 20 to 40 per cent. cheaper than rectangular ones.

The members visited Warrington on the 11th inst., and inspected the Corporation waterworks at Winwick and Hill Cliff. They were driven to the two places, which are respectively on the north and south of the town, and were conducted over the works by Mr. James Deas, the Corporation Water Engineer. The Corporation are making a big extension in their waterworks system at a cost of 247,000*l*. The domestic supply is obtained at Winwick, and the new works there comprise an entirely new pumping station at Delph-lane. The water from the well will be lifted through one mile and a half of 20-in. cast-iron rising main to the Winwick reservoirs. The service reservoir accommodation is being increased by a new reservoir 215 ft. by 190 ft. and 20 ft. deep, with a capacity of 4½ million gallons. At Appleton, from which water is supplied for trade purposes, two new filters and a service reservoir are being constructed, and the existing filters will be reconstructed.

After inspecting the works the members proceeded to Norton Tower, which is 100 ft. high. The capacity of the tank is 600,000 gallons, and the weight when full is 3,000 tons. It is 82 ft. in diameter and 30 ft. 7 in. deep.

TRINITY CHURCH, WEST HAMPSTEAD.—A faculty will be issued from the Consistory Court of London for the building of a mission hall, having a capacity of 325 persons, upon a site adjoining that of the church, and for the placing in the church of a stained-glass window in memory of the Rev. Henry Sharpe, the late incumbent. The church was built in 1872-3 after Mr. Legg's plans and designs.

DETECTING AND PREVENTING THE POLLUTION OF PUBLIC WATER SUPPLIES.*

THE following remarks are intended to apply exclusively to water from moorland drainage areas, as the author considers this subject is sufficient in itself to furnish matter for one paper.

Public water supplies are often taken from sources where it is difficult to detect and prevent pollution, owing to the conflicting interests involved in the ownership of the property taken or affected.

Local authorities often select their sources of supply solely with a view to securing water at a cheap rate, and without much regard to the condition of the land through which it flows. It requires no little experience either to discover watersheds yielding water naturally wholesome and in sufficient quantity, or to deal with supplies which are contaminated.

Water may appear pure and bright and yet be objectionable for domestic uses. Too much care, therefore, cannot be taken in the selection of a drainage area from which domestic water supplies are intended to be drawn. Quality, rather than quantity, should be sought after, in which respect consumers would sooner learn the value of economy in the use of it.

The selection of water supplies generally should be left in the hands of trained engineers, chemists, and geologists, whose professional training qualifies them to give opinions based upon experience and free from local bias, and the selection of the site for works is generally safer left in such hands.

Pollution is a word often used in reference to water supplies, but its meaning has a wide range, because the elements of pollution have not been clearly defined by chemists and bacteriologists, nor understood by the public in general. Bacteria in water are looked upon as objectionable by some scientists and as an aid to purification by others, and while this doubt exists in the minds of specialists, the ordinary consumer will naturally be perplexed.

Water falling on the earth is not chemically pure, and it is questionable whether absolutely pure water is more wholesome than a well-guarded mountain stream containing the impurities common to this class of water. The fouling of moorland waters by ordinary denudation can be prevented by the adoption of the methods described in this paper, and which for many years the author has adopted on the works entrusted to him.

The purity of moorland water can be maintained to some extent by keeping up a constant change and circulation in the supply reservoir. The in- and out- flows require to be evenly balanced, and the water should not be allowed to remain too long at one level, but should be lowered and raised as frequently as possible, especially in the spring of the year, when it swarms with the lower forms of aquatic life. The ova at this time deposited on the sides of the reservoirs are destroyed, together with the vegetation which finds shelter and support in the shallow water Exposure and change bleach discoloured water, and frequent decanting is generally beneficial. The water stagnant in the bottom of a reservoir does not appear to rise to the surface, and thus the benefits of oxidation and purification by exposure are lost; and such water should never be used for domestic supply, but be drawn from as freely as possible when in wet seasons the supply is plentiful, and be given as compensation water. It frequently happens, especially in new reservoirs, that water drawn from the higher level is clear and inodorous, whilst the bottom valve is discharging water offensive both to smell and taste. Too much importance cannot, therefore, be attached to the placing of draw-off valves at different levels in the valve well. Purification begins at the surface, and much time is required for the suspended matter to pass through the lower layers of water and reach the bottom.

Flood water should not be allowed to enter a reservoir from which the supply goes direct to the consumer, unless it be subsequently filtered. Even then it is better to keep it out and supply water derived only from the streams in a normal condition of flow; the flood water being collected and stored in a separate reservoir, whence it can be drawn off when sufficiently clarified. This

* A paper read by Mr. William Watts, M.Inst.M. and M.E., at the recent meeting of the British Association of Waterworks Engineers at Birkenhead.

method, besides providing a purer and greater supply of water, enables the suspended matter to be deposited where it can be removed without interfering directly with the town supply. Heavy floods do not occur more than two or three times a year, and seldom last long. While the volume discharged is great, flood water is not necessarily the most dangerous water flowing from a drainage area. Unless flood-water courses be provided, separation is impossible; moreover, if flood-water is allowed to enter a reservoir at the head of the works, it has a tendency to drive the clean water over the waste weir.

Of course, land drains connected with dwelling-houses and farm buildings should not be allowed to discharge into the lateral feeders of a reservoir; and when the physical features of the land do not admit of a system of drainage being carried out, intercepting wells or cesspits should be constructed so as to arrest the sewage, which should thence be regularly carted away from the drainage area, or be spread on permeable substrata, where it would be effectually filtered and rendered harmless. The safest plan, however, is to purchase the drainage area, and remove all possible sources of contamination.

Some reservoirs are, in a measure, protected by the reservation of a narrow strip of land between the top-water level and any adjacent fields likely to be manured. Manure so placed upon land is, however, liable to be washed off, and so get into the reservoir during heavy rain, especially in frosty weather, and where the ground slopes steeply towards the reservoir. Attention should also be given to the land drains discharging into the streams which feed the reservoir, which naturally occupies the lowest position in the valley.

Water plants should not be allowed to grow in the shallow margins of a reservoir, and constant weeding is necessary in the spring of the year to keep them down. To prevent and to further check their growth the sides should be pitched with stone, and the water drawn down as frequently as possible, in order to destroy the roots as well as any ova deposited upon the vegetation and stone pitching.

The shallows of a reservoir afford suitable spawning ground for frogs, which, with the opening of spring, appear in great numbers, and render the appearance of the water very offensive. This spawn should be collected as soon as it appears, and be buried in lime and soil some distance away. Frogs are not found in deep water or running streams.

Fish should not be allowed to multiply too freely, and care should be taken to exclude all but the cleaner kinds, of which *Salmo fario* are the best, but unless they have a running stream in which to spawn, they do not thrive or multiply, and when confined too long in deep water they grow lank and sometimes become blind. *Fario* will not live long either in a reservoir set apart for the storage of flood water, or of water selected in the manner suggested, as the flood supplies are intermittent. Fish act simply as scavengers, and as such their presence in reservoirs is beneficial, but they do not otherwise purify the water. They, no doubt, devour the ova and larvæ, and many forms of life which exist in water, and the objectionable "limnæ," found in some reservoirs, are reduced by them, and it is also alleged that fish destroy the "cyclops," but the evidence on this point is not well authenticated. In the author's opinion, these crustaceans are too small for fish to notice as food unless their powers of sight are exceptional; these "cyclops," moreover, are harmless, and probably even more beneficial to the water than the fish. as they feed on the minute organisms which are known to carry infection to the consumers. On the other hand, it may be, generally speaking, taken for granted that the fewer the forms of life in water the purer it is; but whether it is therefore more wholesome is an open question.

Trees, although objects of beauty in a landscape, are not always desirable. They prevent evaporation and a free flow of water off the land, and consequently springs are more abundant where forests exist. They should not be allowed to remain where falling leaves can find their way into drinking water; in fact, vegetable matter of every kind should be kept out of streams and reservoirs used for domestic supplies. Such vegetable matter may not be actually unwholesome in itself, but as it provides food and shelter for aquatic life which is objectionable, it is better kept out of the water.

The sources of pollution hitherto referred to may be prevented either by the purchase of the gathering ground, by the proper construction and arrangement of the works, or by good management; but pollution, which it is not easy to detect or remove, is sometimes found to exist on a watershed—such as that occasioned by denuding agencies, and the erosion of the exposed surface of the land, by the solvent power of the water, by objectionable mineral springs, the decay of vegetation, road washings, and matter from dwellings, which cannot very well be removed. By purchasing the drainage area some of these sources of contamination may be removed, and others rendered less injurious; but pollution of some kind will nearly always exist in spite of every reasonable precaution.

The purity of moorland water depends very much upon the character of the streams from which it is derived or conveyed to the reservoirs, and to prevent disintegration the main feeders should be pitched with rubble stone, and the adjacent springs and swampy ground be drained direct into them. Water from peat beds is also very much improved by draining, especially those higher areas from which most of the water is derived. A few leading drains will suffice if opened out and carried deep enough in the right direction. Where stone is not available, open cuttings answer very well, but in a spongy sub-soil the sides require support and protection.

Intercepting or wreck lodges placed across a stream will arrest coarse *débris*, and prevent much silting up of the reservoir. These require cleaning out from time to time when dry weather permits. All that is required is a strong rubble embankment, with a draw-off pipe at the bottom, and a by-pass to be used while the cleaning out is in progress; they need not be watertight, or deeper than from 6 ft. to 9 ft., but the level of the streams will in all cases determine the depth. The author has made many with complete success, and can testify to their value.

The collecting and storing of a town's water supply should be carefully attended to at its very source, whether it be afterwards filtered or not. The streams, drains, and springs are too often neglected, and because of their distance away are visited only at long intervals. Floods sometimes bring down dead sheep, roots and branches of trees, bracken and tufts of hay, all of which are liable to block up the stream in narrow places. To guard against this the principal feeders should be examined directly after a flood, and every obstruction removed. In pitching the drains and feeders, care should be taken to improve their lines as far as possible, and to keep the sections proportionate to the quantity of water they have to carry. This enables it to flow to the reservoir much quicker than otherwise, and it is a decided advantage when, in hot weather, the flow is reduced.

With regard to the action upon lead of certain waters, several methods for preventing this have been suggested, but no effective plan, has, so far, been introduced whereby the acidity of the water is entirely removed so as to satisfy engineers and chemists. Peaty water does not of itself appear to be injurious to health, but the acid it contains acts powerfully upon lead, and may dissolve sufficient to cause lead-poisoning. The remedy which finds most favour with engineers is to pass the water through a layer of chalk or limestone chippings, placed among the coarser material of the filters below the sand. Soft water when brought into contact with limestone liberates carbonic acid gas and causes a deposit of carbonate of lime to form on the surface of the lead, which prevents any further solvent action taking place; but whether this coating is sufficient permanently to resist the action for all time it is impossible to say, and it is obvious that if this coating goes on accumulating, the pipes must become seriously reduced in size.

There is a need for a metallic service pipe which, while equal to lead in ductility and strength, would have, in addition, the power of resisting the solvent action of water charged with peaty and other acids. New piping is more readily acted upon than old, and probably a baser metal than lead—if one can be discovered—is all that is required.

In recent years iron piping has come into more general use, and there is no reason why it should not be even more extensively used, as there is no doubt but that lead pipes and cisterns are dangerous to health when used in the storage or conveyance of soft water.

The time has arrived when spun yarn should cease to be used in making the joints of socket pipes, and cold lead rings substituted. The fibre of the yarn is vegetable material, and in the course of time decays and pollutes the water. Some engineers have dispensed with it, and I see no reason why others should not do likewise. The cost of solid lead joints is a little more than a yarn and lead joint, and the surface of lead brought in contact with the water can be reduced to a minimum. It has occurred to the author that these cold lead rings could be forced in by hydraulic power, and thus save the expense of firing, making joint holes, and setting-up, as in the case of molten lead joints; the sockets could be shortened, and the amount of lead required reduced.

The standardising of pipe sockets, too, is a thing greatly needed, and which would simplify and probably cheapen the manufacture of pipes generally.

No water supply from such sources as have been indicated can be considered as sufficiently pure for domestic use unless it is filtered immediately before it passes into the supply mains, for while it may be potable and wholesome without filtration where arrangements exist for effective decanting, yet cyclops and other low forms of life are liable to go with the water into the mains, and thus find their way to the consumers.

Screening the water through fine gauze is sometimes substituted for filtration, but it is neither satisfactory or so effective as the latter.

The deposition of sediment in the supply mains is also a common cause of complaint, and is intensified every time the water is turned off. Even in the best supplies of filtered water, fine sediment will accumulate in the pipes, and is not all due to the matter in suspension in the water, but partially to peroxide of iron from the metal of the pipes, and is deposited in the form of barnacles, especially when the water is often withdrawn or air gets to them. To remove this, more frequent flushing of the mains is required, the velocity of the water being such as to give an effective scour in the pipes. The districts of supply should not be too large, and although they may be supplied from one common source, each should work independently. Dead ends should not be allowed, and complete circulation of the water should be ensured, as it is not improved by being kept too long in the mains, whereby the benefit of oxygenation is lost.

The author trusts the subject of the pollution of supplies from wells and other sources will be brought before the Association upon a future occasion, so as to make the subject more complete.

A NEW TEST FOR THE FINENESS OF CEMENT.

CEMENT is a material of so much importance to the architect and the engineer that the cost and trouble involved in systematic testing is amply repaid by the knowledge thereby obtained. It is generally admitted that the improvement of quality evidenced during recent years has been largely due to the pressure exerted upon manufacturers as a result of the information acquired in testing operations. Various properties must form the subject of examination if the constructive value of a cement is to be reliably determined. These properties are (1) colour, (2) completeness of burning, (3) activity, (4) soundness, (5) fineness, (6) strength. The new form of test now to be mentioned is connected only with the property of fineness, which is almost entirely a matter of economy. Much of the improvement in the quality of cement during the last decade has resulted from the discovery that the coarse particles have no setting power whatever, and, indeed, for practical purposes they may be regarded as so much sand. This circumstance escaped observation for a long time because tests of strength were nearly always made with neat cement, which, if of good quality, will permit the addition of a certain proportion of inert matter without noticeable loss of strength. Ultimately, when the practice was adopted in Germany of testing cement mixed with sand in the proportion used in practice, it was seen that finely-ground samples exhibited considerable advantage over those less carefully prepared. Hitherto, it has been usual to ascertain the degree of fineness by weighing the percentage of cement incapable of passing through

sieves with a specified number of meshes to the square inch. Formerly a cement was regarded as finely ground if the residue on a 50-sieve was within 10 per cent., but it is now frequently demanded that the residue shall not exceed 5 per cent. of the original quantity. It would, of course, be possible to pursue the practice of grinding until the material became reduced to the condition of an impalpable powder. In such a case the cost of grinding would be prohibitive, and it may be said that the practical limit is reached when the cost of using a larger proportion of cement is less than that of additional grinding.

The essential thing is to know accurately what percentage of the material possesses actual cementitious value, and it is for this class of enquiry that a new form of testing apparatus—known as the Goreham Flourometer—has recently been devised. This appliance is extremely simple in construction, consisting of four parts :—(1) A conical glass into which the sample of cement is placed ; (2) a brass tube having a serrated end passing through the cement, and resting on the bottom of the glass ; (3) a sheet metal tube to whose lower end the test glass is secured by suitable clamps and whose upper end has an air-tight cap through which passes the top of the brass tube, whilst from the upper portion of the tube a branch pipe of equal diameter projects downwards at an acute angle ; and (4) a cylindrical settling chamber, receiving the branch pipe through its side. The settling chamber is covered by a closely fitting lid, and all the joints of the apparatus are made air-tight. In addition to the above-mentioned parts, an aërometer is generally employed for the provision of air at a definite pressure, the air being conveyed from the aërometer to the brass tube by means of an india-rubber pipe.

The method followed in the course of a test is also very simple. In the first place, a weighed sample of the material to be tested is placed in the glass vessel, which is then clamped to the end of the metal tube ; a stop-cock on the air tube is next opened, and as air issues from the serrations of the brass tube it carries away the impalpable portion of the cement, which passes up the sheet metal tube and through the branch pipe into the settling cylinder. When no more cement flour is given off, or after the lapse of a specified time, the glass is removed and the residue is weighed. It is then quite easy to determine the proportion of active material taken over by the air. Mr. Goreham, the inventor, states that he has made a number of tests with different samples of commercial cement, and in these the proportion of flour was found to vary from 20 to 50 per cent., the residuum being therefore from 80 to 50 per cent. In a sieve test the proportion of comparatively fine material passing the meshes would, of course, be much greater, but it is worthy of note that when samples of the same cements were thus tested for the purpose of comparison, the variation was not more than 1 per cent. Although we are not able to verify these statements from personal experience, we have examined the working of the apparatus itself, and believe it is fully capable of doing all that is claimed for it by the inventor.

As we have previously remarked, the condition of fineness is almost entirely a matter of economy. This is especially the case in undertakings where cement has to be transported considerable distances, for no one can desire to pay freight on 80 per cent., or even on 50 per cent., of inert material. Sometimes it may be that the cost of extra grinding will exceed that of freight, but even then the Flourometer test is equally important, for the architect or engineer responsible for the stability and strength of the works under his charge must be exactly acquainted with the value of the cement, if he is to determine the proper proportion of sand or other diluting material with any degree of confidence. The Flourometer test for fineness is not intended to supersede recognised tests for other properties of cement, but so far as it can be expected to extend we believe it will be found in every way reliable.

WESLEYAN INFANT SCHOOL, TONBRIDGE.—The memorial stones have just been laid of a new Wesleyan infant school in Danvers-road, Barden-road, Tonbridge. The contract for the building is 1,075*l.*, and the work is being carried out by Messrs. Martin & Co. The building, which was planned by Mr. John Fagg, consists of a room measuring 46 ft. by 24 ft., a classroom, entrance hall, and cloak-room. It provides accommodation for 157 scholars

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 990*l.* for contributions to street improvements and 10,065*l.* towards electric lighting purposes ; Hampstead Borough Council, 88,579*l.* to repay a loan for electric lighting and 27,897*l.* to repay a loan for wood-paving ; Southwark Borough Council, 2,500*l.* towards the cost of acquiring an extension of Brockwell Park ; Wandsworth Borough Council, 4,000*l.* for wood-paving works and 1,300*l.* for pipe sewer works ; Woolwich Borough Council, 1,270*l.* for paving works ; Stepney Borough Council, 18,703*l.* for an electric light installation ; Hampstead Borough Council, 3,865*l.* for wood-paving works ; Camberwell Guardians, 4,000*l.* for the erection of a relief station and 3,320*l.* for purchase of premises ; Hampstead Guardians, 3,375*l.* for various purposes ; and St. George's Guardians, 14,040*l.* for the erection of homes for children.

Theatres, &c.—The following applications were agreed to :—The conversion of a room situated on the roof of the Frascati Restaurant, Oxford-street, formerly used as a carpenter's shop, into lavatories and ladies' cloakroom (Mr. C. H. Worley).

Windows in the stage roof of the Hackney Empire, Mare-street, Hackney (Mr. F. Matcham).

An arrangement of the electric lighting circuits at the St. Pancras Baths, Prince of Wales-road, Kentish Town (Messrs. Dolby & Williamson).

Alterations proposed to be made to the St. Peter's Institute, Buckingham Palace-road, with a view to rendering the premises suitable for a music and dancing licence (Messrs. Chambers & Son).

District Surveyor for North Battersea.—The Building Act Committee recommended—

"That consent be given to Mr. H. J. Hansom, the District Surveyor under the London Building Act, 1894, for the district of North Battersea, appointing as his deputy Mr. R. D. Hansom, of No. 8, College-gardens, Dulwich, to perform all the duties of such district surveyor, as from July 11, 1901, during the pleasure of the Council ; such consent being subject to the condition that Mr. H. J. Hansom shall not, without the previous consent of the Council to be signified in writing under the hand of the clerk of the Council, act as district surveyor or revoke the appointment of Mr. R. D. Hansom as such deputy, or in any way interfere with the performance by Mr. R. D. Hansom of his said duties."

Mr. Radford moved to refer the recommendation back. He thought that some other arrangement should be made.

Mr. J. Burns, M.P., seconded, and the Chairman of the Committee agreed to take the paragraph back.

The Chief Assistant Architect.—The Establishment Committee recommended, and it was agreed—

"That a retiring allowance . . . be granted to Mr. John Hebb, the Chief Assistant Architect, as from August 20, 1901."

The Architect's Department.—The same Committee recommended :—

"(*a*) That Mr. J. Briggs be promoted to the position of Chief Assistant Architect. . . .

(*b*) That Mr. F. S. Capon be appointed Assistant Architect. . . .

(*c*) That Mr. R. Robertson be promoted to the position of Assistant Architect. . . .

(*d*) That Mr. R. M. Taylor be promoted out of the first class to the position of unclassified officer. . . .

(*e*) That the above resolutions (*a*) to (*d*) inclusive do take effect as from August 20, 1901.

(*f*) That authority be given for the appointment in the Architect's Department of an additional assistant in the first class at the commencing salary of 200*l.* a year."

The recommendations were agreed to.

Paving Works, Millbank Estate.—On the recommendation of the Housing of the Working Classes Committee, it was agreed—

"That the plans, specification, and bills of quantities for the paving with York stone of the footways and with asphalt of the roadways of Herrick and Erasmus streets and portions of Dundonald, Bullinga, Earl, and Atterbury streets, on the Millbank Estate, be approved ; that the work be carried out by the Council without the intervention of a contractor ; and that the plans, specification, quantities, and estimate of 12,700*l.* be referred to the manager of works for that purpose."

Street Improvement.—The Improvements Committee recommended, and it was agreed, that a final payment of 1,686*l.* be made to the Carpenter's-road Improvement Committee, in respect of the contribution promised by the Council on March 14, 1899, towards the cost of the widening of White Post-lane and the reconstruction of White Post-lane Bridge.

Subways.—Replying to questions, Mr. Benn said that the provision of subways under the streets was under the consideration of the committee, but at present there was no power to compel the Post Office, telephone companies, and others to place their mains in the subways. They would consider the question of applying to Parliament for powers to compel the companies to use the subways. There were subways in Queen Victoria-street, but the Post Office authorities chose to tear up that street instead of using the subways.

Richmond-hill.—Replying to Mr. Burns, M.P., Lord Monkswell said he had seen the owner of the property at Richmond-hill, who met him in a very friendly spirit, and he would have several proposals to make to a conference to be held on Friday.

The Council adjourned about half-past seven o'clock.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Lines of Frontage and Projections.

Clapham.—Retention of a wood, tile, and brick verandah in front of a detached dwelling-house on the east side of Thurleigh-road, Wandsworth Common, southward of Ramsden-road (Mr. H. Bignold for Mr. S. J. Tavener).—Consent.

Clapham.—Retention of an iron and glass covered way on the forecourt of No. 2, Ravenslea-road, Wandsworth Common (Mr. A. Boon).—Consent.

Greenwich.—A one-story addition to the Electric Cable Works, Victoria-road, Charlton (Messrs. Johnson & Phillips).—Consent.

Hackney, North.—Houses on the east side of Mount Pleasant-lane, Upper Clapton, between Baker's-hill and No. 121, Mount Pleasant-lane (Mr. G. R. Woodruff).—Consent.

Hampstead.—Porches, with bay windows over, in front of Nos. 3, 5, and 7, Clorane-gardens, Platts-lane, Hampstead (Mr. R. W. Hart).—Consent.

Lewisham.†—Four houses, with one-story shops in front, upon part of the site of The Priory, High-street, Lewisham (Messrs. Norfolk & Prior for Mr. C. C. Story).—Consent.

Lewisham.—An iron and glass hood over the entrance to No. 5, St. Mildred's-road, Lee (the St. Pancras Iron Work Company, Limited, for Mr. W. Cordrey).—Consent.

Lewisham.—A wood and tile pent at the entrance to a dwelling-house on the west side of Blagdon-street, Lewisham, northward of Medusa-road (Mr. E. West). —Consent.

Islington, East.—That the Council do not accede to the request of Mr. J. R. Quilter, for Mr. T. Lee, for permission to retain the two show-cases on the pilasters of Nos. 412 and 414, Holloway-road, Islington.—Agreed.

Hammersmith.—A house on the west side of Paddenswick-road, Hammersmith, adjoining Ravenscourt-park (Mr. L. Lickis for Mr. J. W. Lickis).—Refused.

Fulham.—A shop front, with projecting roof and facia, in front of No. 141, Greyhound-road, Fulham (Mr. E. Avern for Messrs. S. Langston & Sons).—Refused.

Lewisham.—Three one-story shops on the north side of Stanstead-road, Forest Hill, westward of No. 129 (Mr. R. E. Crossland for Mr. E. Paul).—Refused.

Peckham.—A one-story shop on part of the forecourt of No. 24, Gibbon-road, Nunhead (Mr. J. Sykes for the trustees of the late Mr. W. Beasley).—Refused.

Strand.—The retention of a projecting signboard in front of the Windsor public-house, No. 427, Strand (Messrs. J. & H. Cocks, Limited, for Messrs. Worthington & Co.).—Refused.

Strand.—A wrought-iron and copper trade sign to project from the *Building News* newspaper office, on the east side of Clare-market, Strand (Mr. M. B. Adams for the Strand Newspaper Company).—Refused.

Strand.—That the Council do not accede to the request of Mr. J. E. Chevers, for permission to retain an iron and glass projecting sign at the first-

floor level in front of the Savoy Palace public-house, Savoy-street, Strand.—Agreed.

Strand.—That the Council do not accede to the request of Messrs. Wylson & Long, for Messrs. Antiss & Sons, for permission to retain a projecting illuminated sign at the third-floor level in front of No. 45, Strand.—Agreed.

Wandsworth.—A one-story shop and gateway entrance, northward of No. 3, Sunnyhill-road, Wandsworth (Mr. C. M. Quilter for Messrs. Dowsett & Jenkins).—Refused.

Westminster.—Iron and glass inclosures to a portion of a covered way in front of No. 24, Albert-gate, Hyde Park (Messrs. Colls & Sons for Mr. C. Jacoby).—Refused.

Width of Way.

Finsbury, Central.—A building on the east side of St. John's-lane, Clerkenwell (Mr. C. R. Baker King for the Grand Priory of the Order of St. John of Jerusalem in England).—Consent.

Kennington.—A staircase at Cumberland Works, Wigton-place, Milverton-street, Kennington (Mr. A. Parnacott for Messrs. T. & W. Judge).—Consent.

Poplar.—The retention of a one-story workshop on the north side of Wharf-road, Millwall, Poplar (Mr. A. G. Langdon for Messrs. J. Fraser & Son). —Consent.

Woolwich.—A greenhouse at the rear of No. 225, Burrage-road, Woolwich, and the retention of the boundary fence in front of such greenhouse, at less than the prescribed distance from the centre of Church-passage (Messrs. Church, Quick, and Whincop for Mr. H. W. Kier).—Consent.

Hammersmith.—A shed in the garden at the rear of No. 1, Applegarth-road, Brook-green, Hammersmith, with the boundary fence in front of such shed at less than the prescribed distance from the centre of Augustin-road (Mr. E. J. Wilson for Mr. E. F. Bowen).—Consent.

Hackney, South.—The rebuilding of Nos. 56, 58, and 60, High-street, and No. 1, Bridge-street, Homerton, at less than the prescribed distance from the respective centres of those streets (Mr. J. Hamilton for Mr. W. E. Stevens).—Refused.

Whitechapel. — A warehouse building and the retention of a boundary fence at less than the prescribed distance from the centre of Vine-court, Whitechapel-road, Whitechapel (Mr. J. R. Smith for Mr. A. W. Brown).—Refused.

Width of Way, Lines of Frontage, and Projections.

Bethnal Green, North-East.—That the application of Messrs. Francis & Calley, for an extension of the periods within which the erection of buildings on the site of the Arabian Arms public-house, Nos. 222 to 232 (even numbers only), Cambridge-road, and Nos. 2, 4, 6, and 8, Bishop's-road, Bethnal Green, was required to be commenced and completed, be granted.—Agreed.

Limehouse.—A building on the site of Nos. 680, 680A, and 680B, Commercial-road East, and Nos. 3 and 5, Gill-street, Limehouse, at less than the prescribed distance from the centre of Gill-street, and with two projecting turrets and an oriel window next Commercial-road East (Messrs. Niven & Wigglesworth for Mr. A. Scrutton, Mr. T. Mason, and the Rev. E. W. Matthews).—Consent.

Southwark, West.—A steel and concrete gangway across New Park-street, Southwark, to form an approach from Southwark Bridge-road to buildings proposed to be erected on the west side of New Park-street (Messrs. Hubbard & Moore for Mr. H. Ward).—Consent.

Clapham.—A fire brigade station on the east side of Old Town, Clapham, to abut also upon Grafton-square (Mr. O. Fleming for the Fire Brigade Committee of the Council).—Consent.

St. George, Hanover-square.—An iron and glass shelter at the entrance to the Bath Club, No. 16, Berkeley-street, St. George, Hanover-square (the Right Hon. Herbert J. Gladstone for the Bath Club Company).—Refused.

Bermondsey.—A one-story shop on part of the forecourt of No. 127, Long-lane, Bermondsey, at the corner of Kipling-street (Messrs. Barnes-Williams, Ford, & Griffin for Mr. P. Tyrer)—Refused.

Deptford.—A one-story shed on the west side of Charles-street, Deptford (Mr. S. E. Musgrove).—Refused.

Space at Rear.

Fulham.—An addition on a portion of the open space at the rear of No. 331, Lillie-road (Mr. G. Trotman for Mr. D. Thompson.—Consent.

Camberwell, North.—A three-story dwelling-house, adapted to be inhabited by persons of the working-class, on the east side of Crown-street, Wyndham-road, Camberwell (Mr. E. J. Strevens for Mr. R. Knight).—Refused.

Hammersmith.—A block of flats on the west side of Queen-street, Hammersmith, at the corner of Sussex-place (Mr. H. G. Brace for Mr. E. Messiter). —Refused.

Wandsworth.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of four blocks of two-story residential flats on the south side of Coverton-road, Tooting, without an open space at the rear, and of a fifth block at the corner of Condy-road, with an irregular open space at the rear (Mr. W. C Poole for Mr A. Heaver. —Refused

Formation of Streets.

Lewisham.—That an order be issued to Messrs. H. and G. Taylor and Mrs. M. A. Clark sanctioning the formation or laying out of new streets for carriage traffic out of Laleham-road, Catford, on the site of the Catford Sports Ground.—Agreed.

Woolwich.—That an order be issued to Messrs. Farebrother, Ellis & Co., sanctioning the formation or laying out of two new streets for carriage traffic on the Bowater estate, Trinity-street, Woolwich-road, Woolwich, for the trustees of the Bowater estate). That the names Yateley-street (in continuation) and Westfield-street be approved for the new streets.—Agreed.

Lewisham.†—That an order be issued to Mr. W. H. Dawson, refusing to sanction the formation or laying out of new streets for carriage traffic on part of the Forster estate, on the east side of Bromley-road, Catford, at the corner of Sangley-lane (for Mr. H. W. Forster.)—Agreed.

Lewisham.†—That an order be issued to Mr. G. F. Logsdail, refusing to sanction the formation or laying out of a new street for carriage traffic out of the west side of Torridon-road, Hither Green, on the St. Germans estate (for Mr. A. Cameron Corbett, M.P.)—Agreed.

Buildings for the Supply of Electricity.

Hoxton.—A steel framed tower, to be used as a coal elevator (Messrs. Kincaid, Waller & Manville, for the Council of the Metropolitan Borough of Shoreditch).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

Books.

Hints to Young Valuers: a Practical Treatise on the Valuation of Property. By ANTHONY RICHARD CRAGGS, assisted by J. R. V. MARCHANT, Barrister. Second Edition. London: The Land Agents' Record, Limited. 1901.

WE are glad to find that the title of this voluminous volume of 1,074 pages has not been altered, because, important and almost indispensable as this work is, it is yet primarily a work rather for young practitioners than for those who have gained much experience in their profession. On the other hand, the title scarcely does justice to the immense quantity of ground covered by this volume. It is far more than a guide-book for valuations. It is rather in the nature of a handy encyclopædia, dealing with a variety of subjects which fall within the professional work of a land agent, a surveyor, or an architect. The new chapter, for example, on building contracts, which contains an excellent but somewhat too short sketch of the subject, has nothing to do with valuations; and of that on the power of sanitary authorities as to sewers, streets, and buildings the same may be said. We consider, however, that the authors do well to add these and other chapters, because they now place in the hand of every professional man a work of more general usefulness than one on valuation alone could be.

An important new chapter is that devoted to the subject of artificers' work on new erections, adjustment of builders' accounts, restorations, alterations, and repair of buildings. "The valuation of buildings and builders' works is work which frequently claims the attention of the valuer, and therefore it has been thought advisable to treat the subject separately. Such work is often of much importance, and it is frequently of a very complex character. It needs a practical knowledge of almost every class of material and workmanship required in connexion with the erection or upholding of buildings under a variety of conditions." We entirely agree with all this, but we are irresistibly reminded of what Bacon said of himself, that he took all knowledge for his province.

The valuer would seem to be a person who possesses a vast and accurate knowledge of the business of a number of professions. There are few architects who would care to stake their reputation on an accurate valuation of the details of buildings, such work being rather that of a quantity surveyor, for in the chapter to which reference is now being made the work there indicated is that of a quantity surveyor. This fact does not take away from the value of this portion of the book, but it suggests that the young valuer, if he has to go into questions of quantities, would do well to engage the services of one whose profession it is to take out quantities. If, on the other hand, he is to make an estimate of the value of a building, larger views must necessarily be taken than those which would commend themselves to a person taking out quantities, although some general knowledge as to the original cost of a building may doubtless be desirable. Included in this chapter are the regulations issued by the Manchester Society of Architects for the guidance of practitioners in the preparation of bills of quantities, with notes showing any differences between the Manchester and the London practice. We are of opinion that the code, with its notes, would have been more appropriately placed in the appendix.

In the chapter on fixtures the Luton Hoo tapestry case is placed in a preliminary errata, but apart from that case we are inclined to think that the authors take too pessimistic a view of legal decisions from the point of view of the executor. "The tendency of the Courts has been to prefer the heir to the executor." This statement seems to be rather too broadly put. In another edition it would be desirable to lay down the principles which certainly now govern ornamental fixtures, namely, that such things as are not, so to say, incorporated with the building, belong not to the heir, but to the executor. Certainly the Luton Hoo case must be considered, as pointed out previously in our columns, to have liberalised the law on this point.

In the chapter on the conduct of an arbitration, we wish the authors had said something on the expensive and unbusinesslike practice of arbitrators practically acting as advocates, the umpire being the real judge. "A convenient course," it is said, "to save expense is for the umpire to sit with the arbitrators and hear the evidence with them, and give his decision if the arbitrators disagree." In other words, the umpire is to be called in not when, but before, the arbitrators disagree. In our opinion, the appointment of two arbitrators is altogether wrong. It is much more economical and much more satisfactory to refer a dispute to one competent person. When two are appointed, a decision is often a matter of compromise, which might have been attained without the cost of an arbitration. Where there is one arbitrator only, the sense of responsibility is also greater, and the business is frequently carried through with much greater expedition.

We have sufficiently indicated in what manner this work has been enlarged, and what its general character now is. So comprehensive a volume necessarily has its shortcomings, but as it is, it appears to be one of the most useful books that can be found on the practitioner's shelves. There is a great convenience in having in a book, which, though not very large, contains a general mass of information on nearly every point which concerns the architect and surveyor, whether, for the time being, he is or is not a valuer. For, after all, the valuation of property for any purpose is but a limited part of the surveyor's business, and must always be based, to a very great degree, on an almost intuitive power of forming an opinion on a number of often conflicting elements.

Designing Ironwork. Second series. Part II. By HENRY ADAMS, M.Inst., C.E., M.I.Mech.E., F.S.I. Published by the Author. London. 1901.

THIS pamphlet contains notes, formulæ and calculations, and working drawings for a built-up detached steel stanchion, 30 ft. high, to carry a dead load of sixty tons. At the outset, the author points out that a difficulty arises in designing a stanchion or other compression member, that does not occur in connexion with other parts of a structure. As he says, "We cannot by a single calculation proportion the sectional area to the load by taking a factor of safety upon the ultimate strength," for if the length and load be already settled, as is usually the case, the diameter and sectional area have to be determined together with the form of the cross section, and the latter depends upon the proportional dimensions of the member. Moreover, the safe stress intensity cannot be decided unless the ratio of length to diameter is known, and the diameter is governed by the sectional area necessary to provide for the safe stress intensity. Before proceeding to show how the difficulties engendered by this series of complications may best be overcome, Professor Adams gives some brief notes upon various forms of section, rivets, and strength of material. These remarks are concise and useful as far as

they go, but readers of the student class should certainly supplement the information they convey by the aid of a suitable treatise. Coming next to a consideration of the difficulties mentioned above, the author suggests a solution by the process of "trial and error," expediting the operation by using an approximate formula for safe load on an assumed diameter. In an example of this method an approximate sectional area is settled by the assistance of the approximation mentioned and Gordon's formula is applied to test the sufficiency of the proposed section, with the result that it is shown to be inadequate. An increase of the section appears to be unsatisfactory, but further consideration is deferred until the reader has followed the calculation of strength by some fourteen different rules. All these give extremely diversified results, and Fidler's formula is next explained, this equation being recommended, as the most reliable one available at the present day, for the purpose of checking the approximate sectional area and the calculation of strength by Gordon's rule. If the application of Fidler's formula should reveal deficiency of strength the area of the stanchion is to be increased until correct proportions are attained. The mode of procedure recommended by the author can readily be followed, even by those having little knowledge of mathematics, but it is necessarily rather tedious and lacking in scientific precision. We do not wish to imply that Professor Adams is responsible for the latter disadvantages. He has discussed the matter carefully, and has selected two of the most reliable and most easily applied rules for use by his readers. It is true that there are some newer formulas which permit computations to be made in more exact form, but they have not at present come into very general use, and for a work of the kind under review the author is perhaps wise in keeping to the beaten track. When speaking of "reliable strength," Professor Adams appropriately quotes the words of Professor Claxton Fidler that "the strength of columns cannot be defined by any hard-and-fast rule . . . ." and "must be represented by an area, within which the results of individual experiments may be expected to place themselves at haphazard." In such an area the results suggested by various formulas would be represented by different curves, and the most reliable formula must necessarily be that which passes near the greatest number of experimental results.

The remainder of the volume is devoted chiefly to a series of notes upon the safe dead load on foundations, the distribution of load on foundations, concrete filling, fire-resisting treatment, concrete in foundations, and American high buildings. We are pleased to observe, however, that reference is made to the effect produced by a non-axial load, by side thrust, and by foundations that are not central. These points are of much importance, but they too seldom receive attention from writers on the subject of column design. Part II. of the series is eminently practical, the whole of the information it contains being carefully chosen and clearly expressed.

The Cathedral Church of Ely. By REV. W. D. SWEETING, M.A. George Bell & Sons.

THE last issue of Messrs. Bell's small and useful series of cathedral churches is that of Ely, written by Rev. W. D. Sweeting, an ecclesiologist of some deserved repute. It is a good compilation, much use having been made of Dean Stubbs' "Historical Memorials of Ely" and the same writer's handbook. A full critical history of the fabric yet remains to be written, but such a work would require much original investigation, and we have no right to expect it in a book of some 130 pages, a large proportion of which is taken up by a series of upwards of forty good photographic reproductions. The cathedral church of Ely, the longest Gothic church in Christendom, contains fine examples of each successive style; as the exact date of nearly every portion of the fabric is known, this noble building is of the first importance to the student and lover of architecture. A handbook such as this, with its wealth of illustration, forms indeed a useful primer for the beginner. We could wish that Mr. Sweeting had been fuller in his descriptions in some parts, and spared us a rather tedious and commonplace calendar of the lives of all the Bishops of the See, which is too scrappy to be of any real value. For instance, the description of the large and unique fourteenth-century Lady Chapel is disappointingly meagre; an intelligent visitor with this book as his guide will be surprised to find that it gives no help with regard to the wonderful mutilated series of sculptures of the life of Our Lady all round the chapel. If Mr. Sweeting did not feel competent for the task, leave should have been sought to quote in abstract from Dr. Montagu James's work on the iconography of the chapel. Dr. James's admirable lecture on these sculptures was the great feature of the Cambridge meetings of the Royal Archæological Institute in 1892.

Mr. Sweeting deals tenderly with the prolonged and costly process of restoration that this fabric has sustained. Much of it was good and eminently necessary, but the original coloured decorative work of the vaulting of the octagon suffered much in 1879. There was one very queer incident of the restoration begun in 1862 which it would have been well to have named. The choir half of the effigies between the choir and the choir aisles were cleaned up, polished, and renovated, whilst the half on the aisle side were left untouched in their decayed condition. The old couplet, slightly altered, was then applied to this quaintly mean method of effigy restoration:—

"They brightened up the monuments within the ancient abbey,
But, thinking to deceive the Lord, they left the aisle side shabby!"

The Cathedral Church of Bristol: a Description of its Fabric and a Brief History of the Episcopal See. By H. J. L. J. MASSÉ, M.A. London: George Bell & Sons. 1901.

THIS is a further addition to Messrs. Bell's series, and, like the other volumes already noticed, is excellent in matter and illustrations. The majority of the latter are from photographs by Messrs. Bolas & Co. and the author. Particularly interesting are those of the curious tomb in the Berkeley Chapel on page 35, the skeleton vaulting in the vestibule to it, and the heraldic work now in the cloister, formerly on the destroyed choir screen. Two plans are given, one facing page 37 from "Britton's Cathedrals," showing the extent of the church in 1828, before the rebuilding of the nave; the other at the end of the book shows the building as completed. The deviation of the choir from the line of the nave, which is a marked feature of the interior, does not appear to have been noted, and the value of the plan would have been improved by the completion of the cloister, showing the position of the beautiful doorway excellently illustrated from a photograph by the author. The view on p. 46, taken from "Storer's Cathedrals," is not the north transept but the south. All the interesting architectural features are well and clearly described, and, like most others of the series, the work is a capital handbook to the cathedral.

The Abbey Churches of Bath and Malmesbury and the Church of St. Laurence, Bradford-on-Avon. By Rev. T. PERKINS, M.A. London: George Bell & Sons. 1901.

UNIFORM in size and style with the Cathedral Series, this volume illustrates three buildings, all of strongly marked character and difference in date, and lying in the same district not many miles apart. The smallest of the three and the earliest is the Saxon church at Bradford, capitally illustrated by a series of views from photographs by the author. The ground plan has no scale, however, neither have the larger plans at the end of the book of Bath and Malmesbury. Malmesbury, a picturesque mixture of Norman and Decorated, has recently undergone some repair, and some of the illustrations have been, apparently, taken during the progress of the works. Among many excellent photographs are two good views of the south side of the church (facing pages 65 and 75), a view of what remains of the "crossing" and two interior views of the north side of the nave.

Bath, though placed first in the book, is now a building of Late Perpendicular character. A good many fragments, however, remain of the Norman columns under the floor of the nave and choir; these, though noted in the letterpress, have been ignored in the plan. As in the other buildings, the illustrations are from photographs by the author. One of Prior Bird's Chantry in the choir and the Montague and Waller tombs shown on pp. 22-23 are, perhaps, the most striking of an interesting series.

The French Stonehenge; an Account of the Principal Megalithic Remains of the Morbihan Archipelago. By T. CATO WORSFOLD. London: Bemrose & Sons.

THIS is an interesting popular account of the stones at Carnac, with comparisons between them and the relics of the same class at Avebury and Stonehenge, and a brief summary as to the various popular and archæological beliefs in regard to these Breton monuments. It does not go further than this, and makes no attempt to throw new light on the subject of the origin and purpose of these collocations of stones; but it is an interesting illustrated account of them.

The author draws attention to two important distinctions between Carnac and Stonehenge; one is, the partial shaping of the blocks and the formation of the mortise and tenon joints between the uprights and the lintels at Stonehenge; the other, the fact that at Stonehenge; no human bones have been found at any time—so, at least, he states.

Early Defensive Earthworks. By J. CHALKLEY GOULD. Bedford Press.

THIS pamphlet of thirty pages gives the substance of two papers read before the British Archæological Association in 1899 and 1900, and is worth reproducing. Mr. Gould has no particular theory to advocate as to dates and origin of the early defensive earthworks of England; but in his desire to increase interest in them and to aid in their preservation, he writes pleasant and intelligent accounts of some of the more remarkable examples, such as the Carl's Wark and Main Tor, Derbyshire; Maiden Castle and Hod Hill, Dorset; and Ambresbury Banks, near Epping. Plans and illustrations add to the value of this reprint.

A Brief Sketch of the History of Ipswich School. By NINA F. LAYARD. Ipswich: W. E. Harrison. 1901. 1s.

THIS is mainly a history of the school foundation, but it has a certain archæological interest in connexion with the ancient buildings in which the school was successfully housed. Down to 1763 the school was held in the chapel of the ancient Black Friars Monastery, the buildings of which were made over to the use of the school about 1565-66. From 1763 to 1842 the school was held in a fine room with a hammer beam roof over the Refectory. Part of the lower portion of the building is still standing, and forms the boundary wall of the girls' endowed school in Foundation-street. In 1842 the school was removed to a new building in Lower Brook-street, and in 1852 to the present building in Henley-road. Views of the various old buildings are given, as well as of the recent ones, as also a plan of the buildings on the site of Black Friars.

Weights and Measurements of Sheet Lead. By JAMES ALEXANDER. London: E. & F. N. SPON. 1901.

THESE are simply tables giving the area of lead for widths from 6 ft. to 7 ft. 10 in. and for many various lengths. They are compiled for the use of lead rollers, plumbers, builders, and architects, &c., to save time in arriving at the estimated weight of a given length and breadth of sheet lead, at so many pounds to the square foot. Thus, we can see at a glance that a piece of 6½ lbs. lead 26½ ft. long weighs 10 cwt. 3 qr. 2 lbs. It is a conveniently small book, and is calculated to save a good deal of trouble.

BOOKS RECEIVED.

THE WORKMEN'S COMPENSATION ACTS, 1897 AND 1900. By W. Addington Willis, Barrister-at-Law. (Butterworth & Co. and Shaw & Sons.)

A BRIEF SKETCH OF THE HISTORY OF IPSWICH SCHOOL. By Nina Frances Layard. (W. E. Harrison, Ipswich.)

THE FRENCH STONEHENGE. By T. Cato Worsfold, F.R.Hist.S., &c. (Bemrose & Sons).

A DICTIONARY OF ARCHITECTURE AND BUILDING: edited by Russell Sturgis. Vol. II.: F—N. (Macmillan & Co.).

WESLEYAN CHURCH, HELMSLEY, YORKSHIRE.—The Wesleyan Methodists of the Helmsley Circuit intend to rebuild their place of worship. Messrs. Hornsey & Monkman, York, are the architects.

LONDON BUILDING ACT, 1894.

TRIBUNAL OF APPEAL CASE.

THE Tribunal of Appeal under the London Building Act met at the Surveyors' Institution on Tuesday to hear an appeal by Mr. R. Langton Cole, on behalf of the Metropolitan Association for Improving the Dwellings of the Industrious Classes, against the disapproval of and the refusal of the London County Council to sanction the plans of a block of intended dwelling-houses to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site at the rear of houses on the south side of an unauthorised street, known as Gibson Buildings, Northwold-road, Stoke Newington. The members of the Tribunal sitting were Messrs. J. W. Penfold (Chairman), A. H. Hudson, and E. A. Grüning.

Mr. Cole conducted the appellants' case in person, and Mr. Andrews and Mr. Godfrey, of the London County Council solicitors' department, were for the Council.

Before Mr. Cole opened the case for the appellants Mr. Andrews remarked that they were so very near each other in agreeing that it did not seem desirable to prolong the proceedings by producing unnecessary evidence. The Association sent plans to the Council showing their proposals, and the Council were bound, under Section 42 of the Act, to refuse or approve them within a certain time. They refused to sanction the plans because they wanted certain conditions, and at his (Mr. Andrews') suggestion they wrote to Mr. Cole proposing that he should see them and discuss the points with the Council. He could assure the Tribunal that the Council was very anxious not to retard or stand in the way of the erection of working class dwellings by a responsible Association such as the appellants on well-conceived lines, and it seemed probable that the Council would be able to meet Mr. Cole and to come to some arrangement which would obviate the difficulty which the Council felt would ensue by their not passing the plans. Practically, it had come to this: Mr. Cole was prepared to give the amended plans as suggested to him, and in view of that fact it would be for the Tribunal to make an order registering them. But even if the scheme, if it remained as it now stood, could not be considered in any way undesirable by the Council, it was more on the *qui timet* principle—looking forward to what might happen in regard to the adjoining ground—that they acted.

Mr. Cole: I take it that the County Council would agree to the plans as they now stand were it not for the possible alteration in the adjoining buildings? The plans of the building as at present produced are in accordance with the section.

Mr. Andrew: I do not say that we are not entitled to refuse even on the plans.

Mr. Cole replied that if, without going so far as that, the Council would consent to the plans, they might subsequently get over the difficulty with the adjoining owners. He contended that on the plans he was entitled to a decision in his favour.

Mr. Andrews said that clearly the County Council were entitled to act on their discretion; on the other hand, they were prepared practically to concede, so far as they were able, their objections in regard to the plans.

The Chairman said that as he understood it, the Council would not object to the plans if some arrangements were come to with the adjoining owner.

Mr. Andrews assented.

Mr. Cole pointed out that he had an interview with Mr. Andrews as was suggested, and the net result was that the Council would not object to the plans, provided that the District Surveyor passed them. He applied to the District Surveyor on May 6, and he at once said that he would not pass them, and must throw the responsibility upon the Council. On May 22 he forwarded the plans to the Council under Sections 41 and 42, and the result was the refusal to approve unless arrangements were made with the owner of the adjoining land, by which he would agree not to raise the height of his buildings inside his line. It was obviously impossible for them to comply with that. The owner, unfortunately, was only the leaseholder, and any arrangement as to the future height would necessarily take considerable time, and involve more expense to the Association than they could afford to spare. Under the circumstances the Association decided that their proper course was to appeal. If the Council required as a *sine qua non* that this condition should be exacted from the adjoining owner, it was apparent that the appellants could not insist on the terms suggested. They would rather suggest some modifications of the plans by which possible difficulties might be surmounted. He ventured to suggest that it was unreasonable for the Council to refuse the plans of buildings which entirely complied with the Act on the ground that in future something might happen which was beyond the Association's control.

Mr. Andrews said there were many points in the plans which would entitle them to refuse sanction. For instance, there was the question of access. If they fought the appeal out there were other points, but they were small. If the adjoining owner would say that he was not going to raise his buildings at present on what they called the dairy premises, the Council would be satisfied. It was possible if the adjoining building was heightened, the living rooms, particularly the kitchens, of the proposed dwellings would become, so far as they abutted on each floor, unhealthy. If the suggested terms could not be come to, then possibly some modifications could be made in the plans.

The Chairman said the Tribunal had no power to make such conditions.

Mr. Cole said he did not wish to fight the case out in a spirit of hostility, but his clients felt that the Tribunal should decide, as they believed they would, that the plans complied with the Act.

After further discussion the Tribunal allowed the appeal and approved the plans on certain conditions—namely: (1) That the cottages on the north-west side of the proposed new buildings shall not be added to or raised; (2) that no building be erected on the area between the adjoining dairy buildings and the proposed building; (3) that a sufficient access of not less than 3 ft. in width be provided between certain points, and that the access at the eastern end of the site be by a slope and not by steps.

Illustrations.

ST. MARY WOOLNOTH.

THE plan and the two sections of Hawksmoor's remarkable church, which has with difficulty been saved from destruction at the hands of a railway company, are reproduced from measured drawings made by Mr. Alfred C. Bossom. The perspective view of the west front was specially drawn for the *Builder* by Mr. W. Curtis Green.

A church of St. Mary Woolnoth is cited as early as the year 1274 (*see* Dr. Sharpe's Calendar of Wills, proved and enrolled in the Court of Husting, Part I., 1889) under an entry whereby Geoffrey Godard devises to the church half a mark annual rent for arrears, and to his eldest daughter, Johanna, his capital house in the parish. Some maintain that Woolnoth is a corruption of "Wulfnoth"; others that it is a corruption of "woollen hithe"; though the wool hithe, or wharf, we may observe, was situated in Lower Thames-street, near the Tower. It is also asserted that the name of the former neighbouring and daughter church of St. Mary Woolchurch Haw (or Ulnorum) was derived from the haw, or garden, appertaining to "Wlnotmaricherche" cited in a deed of 1191—*teste* Mr. J. H. Round in the *Athenæum* of March 31, 1888. *Note*, or *neath* signified "business" or "traffic"; the connexion of St. Mary Woolchurch Haw (which stood where are now the Saloon and the Venetian and Long Parlours of the Mansion House) and of St. Mary Woolnoth with the wool trade obtains general acceptance. Stow says that the former was "so called of a beam placed in the churchyard which was thereof called Woolchurch Haw of the tonnage or weighing of wool there used."

However that may be, a church was standing on the present site (supposed, though erroneously, to have been that of a Christian church, previously dedicated as a temple of Concord), in the earlier years of the thirteenth century for a parish taken, with others, out of that of St. Mary Aldermary. That church was rebuilt about two hundred years afterwards, a chapel and a steeple being added by Hugh Brice, or Bruce, who was elected Lord Mayor in 1485, and died in 1496. The church was again rebuilt in 1620.

After the great fire Wren repaired the north side of the church in 1677, but a "case" presented to Parliament in the reign of Queen Anne sets forth that "the east end, adjoining her Majesty's post-office, with the south side, west end, and tower thereof, were not rebuilt," and that the north side had become ruinous and dangerous, insomuch so that the parishioners feared to attend Divine service. An Act of Queen Anne appropriated a certain sum to be raised by a tax upon coal for the new church, which, according to an inscription upon the front of the former organ-gallery was completed in 1727, from the design of Hawksmoor. Twenty of Hawksmoor's working drawings are preserved in the British Museum. The rectory house was built after Sir Robert Smirke's designs. On May 28, 1892, we published a lithograph from a monochrome water-colour drawing by Miss A. Fooks, showing (in part) the interior as it was remodelled in 1875-6, by Mr. Butterfield, who removed the galleries but happily retained their fine carved fronts by fixing them as an architectural feature around the walls, where they plainly tell the history of the change. In 1868 the organ, against the north wall (by Smith, 1681), was rebuilt by Messrs. Gray and Davison; in 1875 it was moved to the east end.

During some months in 1886 the church remained closed by reason of the insanitary condition of the vaults underneath the floor. Under Mr. F. C. Penrose's directions the under surface of the vault arching was covered with iron joists, and concrete was overlaid with two ½-in. thicknesses of asphalte. In November, 1892, a faculty was granted by the Consistory Court for the removal, at a cost of 2,000*l.*, of all the human remains from beneath the church, the untoward condition of which, in that respect, it had been foolishly contemplated to remedy by pulling the entire building down.

The church was again threatened with demolition by the promoters of the extension line to Islington of the City and South London Railway Company. In the result the church was closed during a period of three years, 1897-1900, whilst it was in temporary possession of the railway company for the construction of a station in the place of the crypt, of which the walls were found to be built, for the most part, of chalk. In that interval the interior of the church was renovated and redecorated under the superintendence of Mr. A. R. Stenning, the decorations being carried out by Messrs. Heaton, Butler, & Bayne, with an electric light installation by Mr. Sclater. The church was re-opened in May, 1900. The four Corinthian columns and the north, south, and west walls now rest entirely upon steel girders six or more feet deep which extend from end to end of the structure; the whole floor was relaid with wooden blocks; the vestry was rebuilt and remodelled, and its floor raised to the level of that of the church, by the railway company, and so far, as we gather, no trace of settlement has been discovered. We may add that this is the first City church that was opened for daily prayer; that the chancel chairs are made from a pile of old London Bridge; and that the remains of John Newton, the rector and Cowper's friend, were removed from the crypt to Olney in January, 1893.

On the north wall is a mural monument to the memory of Henry Fourdrinier (1730-1799), stating that "in his character were combined the kind husband, good father, and sincere friend." This Fourdrinier was the son of Paul Fourdrinier, the well-known engraver of architectural subjects, whose name is found in the corner of a good many of the plates in Kent's book of Inigo Jones's designs, and in other publications of the period; and he was the father of that Henry Fourdrinier who expended his large fortune in perfecting the paper-making machine, and the great-grandfather of the present publisher of the *Builder*.

The following are some notes on the construction, made by Mr. Bossom while measuring the work:—

"The accompanying drawings show a few peculiarities in the construction of the church; there are also a few noteworthy points that the drawings do not show—for instance, the main entablature is partly composed of a wood bressumer, which sags slightly in the middle. The cornice of this entablature is a casing supported partly by a 9-in. by 3½-in. iron joist, to which it is connected with iron straps, and partly by the bressumer. The upper entablature is composed of plaster, and the walls also have had a thin coat of it on them, but this is not thick enough to obliterate the stone joints. The walls of the clearstory do not follow centrally over the capitals of the columns below, but are slightly on the inner side.

The small turrets on the tower are partly carried on the external walls and partly on a stone lintel (halved as though it were of wood) which extends across the inside of the tower at the level of the capitals outside.

The roof is constructed of wood as shown on the sections. The horizontal portion of the construction is a very complicated arrangement, the members varying between 10 in. by 11 in. to 3½ in. by 2 in. Lead forms the outer covering.

All the lower windows facing King William-street are double and have a space of 11½ in. between the two leaves.

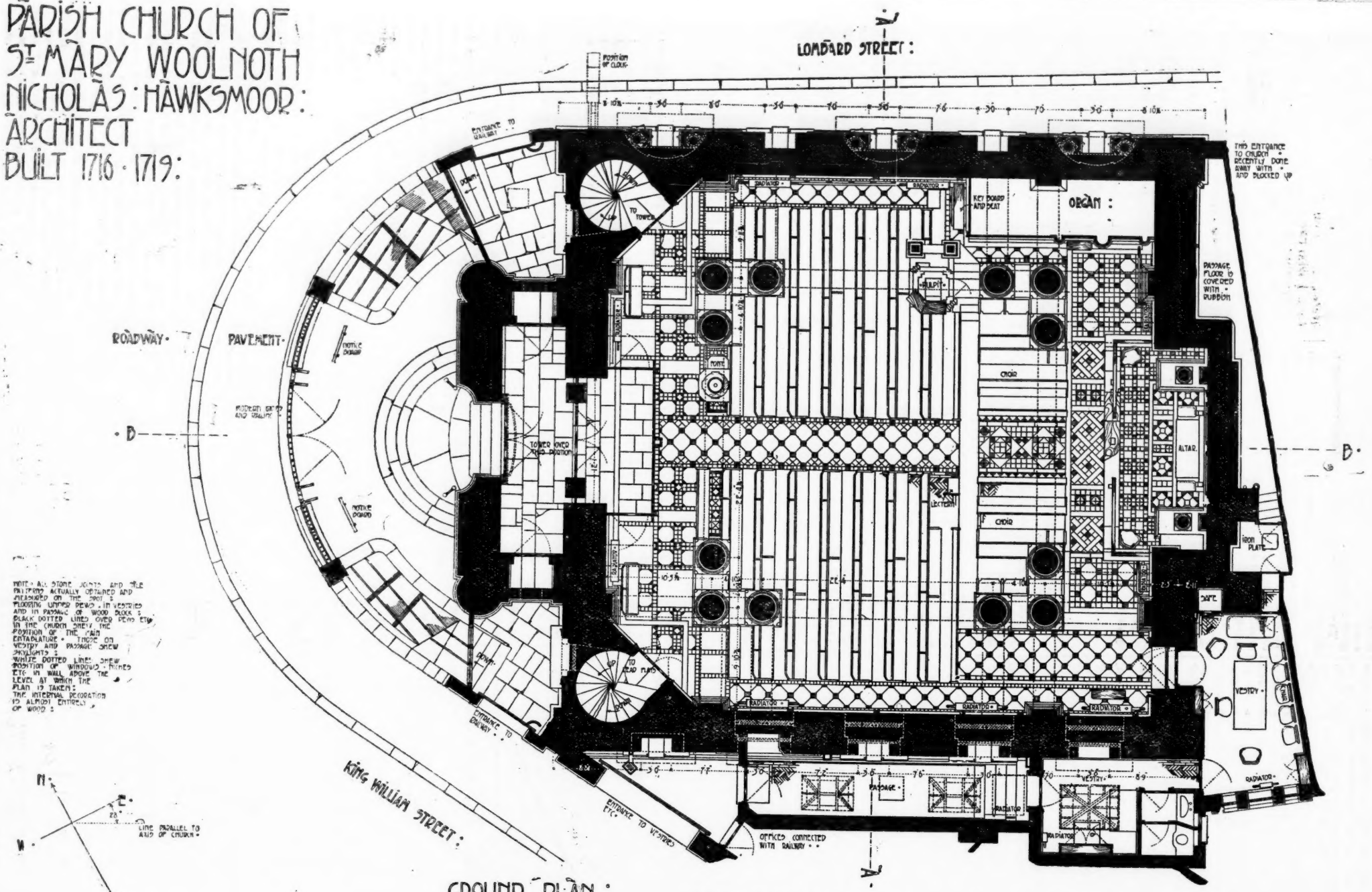
The wood panels and door that are shown in the north section on the wall, form the remains of a gallery that once extended along each side of the church.

The work generally seems to be in a very good state of preservation, the interior especially, as it has only recently been thoroughly

PARISH CHURCH OF ST MARY WOOLNOTH

NICHOLAS HAWKSMOOR: ARCHITECT

BUILT 1716-1719:


LOMBARD STREET:
KING WILLIAM STREET:
ROADWAY
PAVEMENT
ORGAN:
CHOIR
ALTAR
VESTRY
PASSAGE
RADIATOR
OFFICES CONNECTED WITH RAILWAY
ENTRANCE TO VESTRIES ETC.
THIS ENTRANCE TO CHURCH RECENTLY DONE AWAY WITH AND BLOCKED UP
PASSAGE FLOOR IS COVERED WITH RUBBISH
NOTE:- ALL STONE JOINTS AND TILE PAVING ACTUALLY OBTAINED AND MEASURED ON THE SPOT:
FLOORING UNDER PEWS IN VESTRIES AND IN PASSAGE OF WOOD BLOCKS:
BLACK DOTTED LINES OVER PEWS ETC IN THE CHURCH SHEW THE POSITION OF THE MAIN ENTABLATURE - THOSE ON VESTRY AND PASSAGE SHEW SKYLIGHTS:
WHITE DOTTED LINES SHEW POSITION OF WINDOWS PIERS ETC IN WALL ABOVE THE LEVEL AT WHICH THE PLAN IS TAKEN:
THE INTERNAL DECORATION IS ALMOST ENTIRELY OF WOOD:
LINE PARALLEL TO AXIS OF CHURCH

GROUND PLAN:

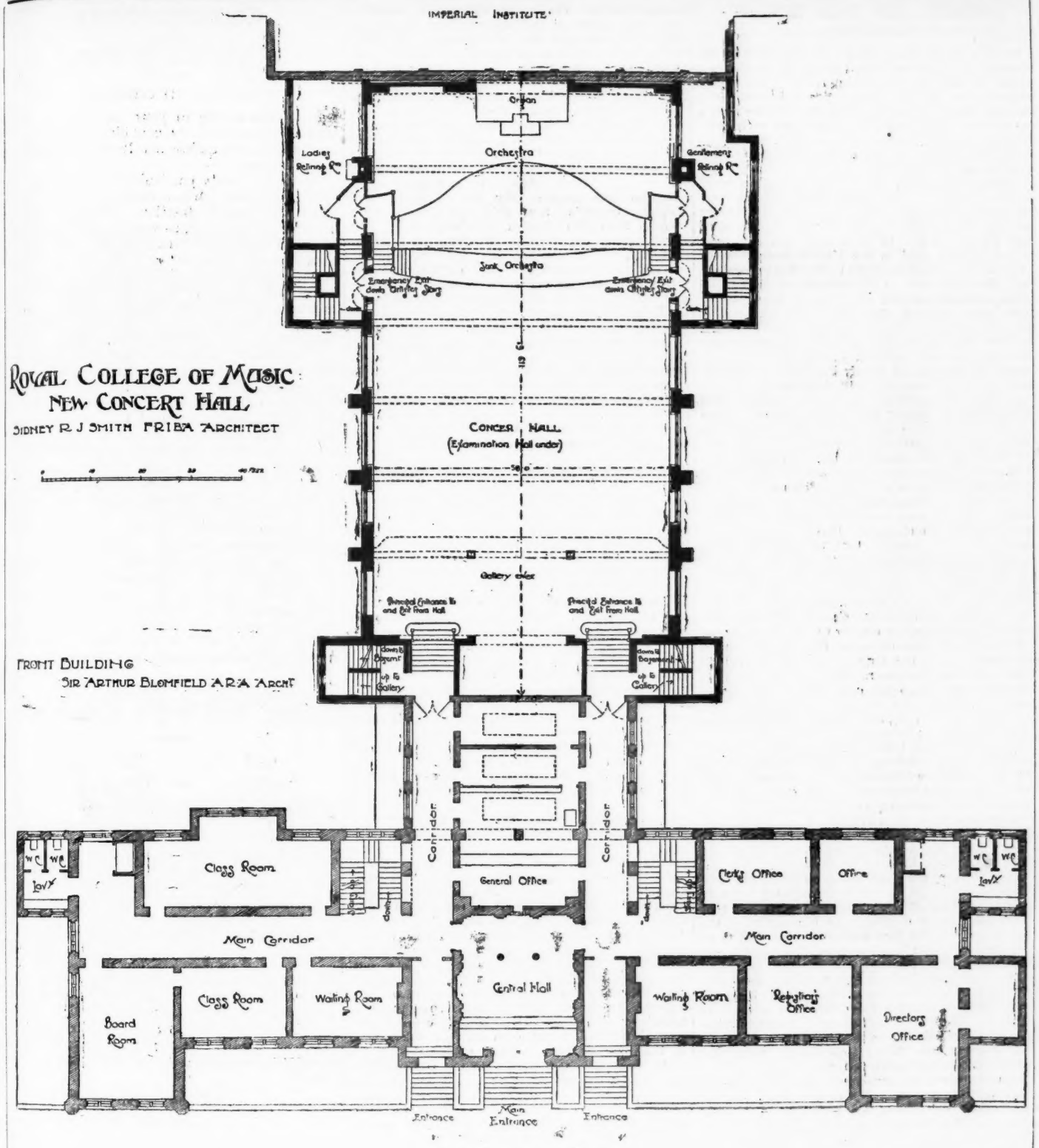
SCALE 0 5 10 15 20 25 30 40 50 60 70 FEET

Plan of St. Mary Woolnoth. Measured and Drawn by Mr. A. C. Bossom.

[See preceding page.

NEW HALL AND MUSEUM FOR THE INNER TEMPLE.—The Benchers of the Inner Temple have decided to erect a new hall and museum on the site of the old hall, which was destroyed by fire in 1868. The competition for the new building was limited to the assessors, Messrs. Aston Webb and Ingress Bell, who was placed first, and Mr. Arthur Keen, who was placed second, it out. The premiums are £300 and £200 respectively. The new building will contain a hall, library, museum, and college rooms, and will be erected on the site of the old hall, 119 ft. by 50 ft.

ROYAL ACADEMY OF MUSIC.—The Duke of Connaught, K.G., presided at the annual meeting of the Royal Academy of Music, held on Monday last, at the Academy, Tenterden Street, Hanover Square. The Duke, in the course of his address, said that the Academy was in a very satisfactory condition, and that the number of students was increasing. The Duke of Connaught, K.G., presided at the annual meeting of the Royal Academy of Music, held on Monday last, at the Academy, Tenterden Street, Hanover Square. The Duke, in the course of his address, said that the Academy was in a very satisfactory condition, and that the number of students was increasing.



GROUND FLOOR PLAN

renovated, at which time the colour decoration on the walls was done away with."

The west front of the church is a notable example of Hawksmoor's originality of style, and, for its scale, is one of the most remarkable and powerful bits of architecture in London. It is instructive as showing how it is possible to be original without the invention of new architectural details. The forms of columns, pilasters, cornices, &c., are such as are familiar to us and are all to be found in books; yet the whole thing is a distinctly new conception, resembling no other classic building.

NEW CONCERT HALL, EXAMINATION HALL, &c., ROYAL COLLEGE OF MUSIC.

THE design for this building was selected in competition, Mr. Belcher, A.R.A., being the assessor, and Mr. Sidney R. J. Smith's design was placed first and he was instructed to carry it out.

The new buildings are at the rear of the college, and comprise the large concert-room, 119 ft. long by 58 ft. wide and 43 ft. high, with a gallery at one end, the seating capacity of the whole being 900, while the orchestra will accommodate a band and chorus of at least 230 performers. On the east side of the hall at the orchestra end are artists' rooms on three floors, and beneath the hall is a spacious examination-room, 78 ft. long, 58 ft. wide, and 16 ft. in height; there are also large storerooms, heating-chamber, and hydraulic engine and bellows room for blowing the large organ.

The roof is constructed of iron with fibrous plaster soffit, elliptical in shape, and heavily moulded in panels, there being a passage-way through roof for ventilation, electric wires, &c. The room is faced internally with Parian cement and a wooden dado all enamelled white. Externally the building is of red brick and green slates to roof. There are spandril figures (different subjects) internally over each window emblematic of "Music," modelled by Mr. Wheatley. The lighting is by electricity, concealed lights being placed all along main cornice, while a few brackets below give light at other places necessary.

The orchestra, under the direction of the director, Sir Hubert Parry (who presented the organ to the college), has been very carefully considered, and is said to have worked extremely well at the opening concert. Part of it can be extended by means of rollers, or if a smaller orchestra is required it can be reduced by running it under the fixed parts.

The building was erected by Messrs. G. H & A. Bywaters; Messrs. L. D. Berry & Sons did the warming; Messrs. Spagnoletti & Co. the electric lighting; Messrs. Dennett & Ingle the ironwork; Mr. J. Stone the iron casements and doors; and Messrs. Shuffrey & Co. the stoves.

We give a plan of the additions, with a section and part elevation of the interior of the hall, from drawings kindly prepared for us by the architect.

CHURCH, SMETHWICK.—The new Church of St. Chad's at Cape Hill, Smethwick, was consecrated on the 1st inst. The building provides accommodation for 600 worshippers. The interior is faced with red brick dados and quoins to all windows, the remaining portions of the walls being plastered. The open-timbered roof is of pitch-pine and red deal. The building, which cost 5,250*l*., was erected by Messrs. J. Harley & Son from the designs of Mr. F. J. Gill.

AMERICA AND THE CEMENT INDUSTRY.

IN view of the extraordinary development of the cement industry in the United States, which does not appear to have been receiving from British manufacturers the amount of attention it deserves, Mr. Bell, the British Commercial Agent in the States, has been at some pains to collect and summarise the available information on the subject. From his exhaustive Report we gather that during the nine months ended March last, out of 541,701,557 lbs. of cement imported, the United Kingdom only supplied about 11 per cent. The previous year the British cement imported amounted to 9·5 per cent. of the total, whilst in 1899 it was more than 15 per cent. In 1891 only 13·2 per cent. of the cement used in the United States was of American manufacture, while in 1899 this percentage had risen to 73·9. This increase of output of American-made cement is, however, barely doing more than keeping pace with the increase in demand; consequently the imports do not show the decrease that might be expected. So many new factories are being built that in time the increase in supply will exceed the yearly increase in demand, and the amount imported will decrease in proportion. It will nevertheless be many years before the importation of cement will cease entirely. There has been for long a great prejudice among contractors and engineers against the home product, but this is fast disappearing. Mr. Bell thinks that in time it will disappear entirely, and that the United States will be able to produce sufficient to supply all its home markets, together with a surplus for export. It is a very sore point with the American cement manufacturers that there are still engineers who specify for imported Portland exclusively, notwithstanding the fact that many of the best brands of the home product are establishing a reputation for high quality, and the manufacturers are willing to offer substantial guarantees. The manufacturers maintain that the domestic product is at least equal in quality to the German, and is from 50 c. to 1 dol. cheaper. Of foreign cements, the German has the largest sale in the United States. During the nine months ended March last, Germany supplied 46 per cent. of the total amount imported; in 1900, for the corresponding period, 54 per cent.; and in 1899, 49 per cent. Belgian cements come next with 34 per cent. in 1901, 30 per cent. in 1900, and 32 per cent. in 1899. The price of German cement imported during the nine months ending March averaged a little over 40 c. per cwt. The Belgian averaged nearly 35 c., and that from the United Kingdom about 43⅓ c. per cwt. The previous year the German cement averaged 40 c., the Belgian about 33⅓ c., and the British over 44 c. per cwt These figures would indicate that the Belgians are able to do their business on account of the low price of their product, notwithstanding its acknowledged inferiority, while the Germans are practically underselling the British, it being conceded that there is not much difference in the quality of the best brands of the two countries. In 1898 there were thirty-one works in the United States, producing 3,692,284 barrels of Portland cement, valued at 5,970,773 dols, and in 1899 there were thirty-six works, producing 5,652,266 barrels, valued at 8,074,371 dols. That is to say, there was an increase of 53 per cent. in quantity, but only 35 per cent. in value. The Lehigh Valley region in Eastern Pennsylvania and Western New Jersey is the seat of the first successful establishment for the manufacture of Portland cement, and has from the first produced more than the rest of the States combined. This is due to the occurrence in that district of an immense deposit of clay limestone, belonging to the calciferous formation which has nearly the composition of a Portland cement mixture. There are two works in the district said to be larger than any other works in the world. One is producing 8,000 barrels per day and is increasing its capacity still further. Owing to the keen competition in the States, a sharp fall of prices may be anticipated as far as the domestic product is concerned, and there may also be a decrease in the demand in the course of the next few months; the result will be the shutting-down of many of the smaller and less favourably situated works, owing to over-production. In modern American cement plants, as in nearly ever other works in the United States, the notable feature is the substitution of fuel and power for labour. Manufacturers understand the necessity of reducing the cost to a minimum. Machinery is substituted wherever possible to eliminate labour. Crude petroleum and natural gas are used when possible for fuel, and the latter is sometimes used to drive the engines. In some of the modern works electric power is used for driving the machinery as well as for lighting purposes. In the best arranged works the rock, from the time it is loaded into trucks in the quarry to the time it is packed as finished cement ready for shipment, is not once moved by hand. The only manual labour employed in the mill proper is that necessary for operating the machinery. The main idea is to make the plant as nearly approaching automatic as possible. Every known mechanical device for rapidly and efficiently handling the materials is introduced wherever possible. This is often done at considerable cost, and the apparatus is duplicated as far as possible in order to avoid delays should any part become broken. This is considered as of considerable importance in the manufacture of cement, where the wear and tear is so great. In addition to Portland cement, large quantities of natural rock cement are manufactured. This is chiefly made in the States of Indiana and New York. In the year 1899 there were seventy-six works, producing 9,868,179 barrels, valued at 4,814,771 dols. The total consumption of imported Portland cement during the same year was 2,108,388 barrels, and of the domestic Portland 5,652,266 barrels, bringing the total consumption of all kinds of cement up to 17,628,833 barrels. In endeavouring to ascertain the reason why the German and Belgian cements are sold so much more largely than the British product, Mr. Bell found that a considerable difference of opinion prevailed, but he considers that the various points of view are comprehended and explained in the following three opinions which he quotes textually, and neither of which, he points out, is favourable to the British manufacturer:—1. The representative of an important importing house, handling three German brands, two British, and one Belgian, says: "The falling-off in the sale of British Portland cement in this country which took place some five or six years ago was partly due to the fact that the German cements proved so much more satisfactory as to quality, and Belgian cements of fair quality selling so much cheaper, while British makers were unwilling to make any improvement in the quality of their product. Notwithstanding, there continued to be a limited sale for the British brands, but during the last few years British makers had such a demand for their cement at home and from other foreign parts that it enabled them to obtain a higher price for their cement elsewhere than in the United States, so that they did not care to make any concession to the American trade, and this has led to a further decline in the sale of British cement in this country, which in the Eastern and the Western States is at present very unimportant. On the Pacific Coast, where the British makers have the advantage of very low freight rates, their cement is still sold in considerable quantities." 2. An American cement expert expressed the following view: "British cement was at one time almost the only Portland cement in our market. German cement rapidly replaced it, however, owing to the superior quality of the German product. No doubt some brands of British cement are now much better than formerly, and probably equal to the best German. However, there is an immense number of German masons in this country who prefer the German product and will use no other. The Belgian cement gained a foothold in consequence of its low price, and has been preferred to the American Portland on account of being an imported article. It is certainly generally inferior in quality. The low price of American cements has nothing to do with quality, but is due to senseless competition among American manufacturers. Tests made by a multitude of competent engineers show that the best American cements are superior to all other brands. In my judgment, the only reason why any cement is imported is that the American product has until lately been insufficient in quantity, and also that there are many consumers who are willing to pay a higher price for an imported article, regardless of tests." 3. The editor of the leading cement trade journal writes: "Our own idea of the subject is that the German cement manufacturers are more thoroughly represented in the United States and make a greater effort to obtain orders in the interior than do the British manufacturers. German cements are more thoroughly advertised, and when making contracts with cement brokers they have the contract read that said brokers shall employ travelling salesmen to secure orders. In our opinion, the British cements imported into the United States are fully equal to the German product, as the makers of the poor British grades find no market here. The German manufacturers obtained a strong foothold in the United States owing to their first introducing cements adulterated with 2 per cent. or less of gypsum, which controls the setting of the cement, and for this reason they have maintained their prestige among certain consumers."

ST. CUTHBERT'S CHURCH, SHEFFIELD. — The foundation-stone of St. Cuthbert's Church, Firth Park-road, Sheffield, has just been laid. The building forms part of a church extension scheme, which was inaugurated about two years ago, and it will be the centre of a new parish formed of parts of Ecclesfield, Grimesthorpe, and Pitsmoor. The contract has been signed for 5,300*l.*, but the church will cost about 3 000*l.* more to complete. The building will be erected on a site between Barnsley-road and Firth Park-road. It will be in the Early English style, and will be built of stone. The present contract is for the chancel, organ chamber, and vestries, a part of the nave, and the corresponding portions of the transepts. The church has been designed to accommodate a congregation of about 700; but the portion of the edifice which will be completed under the present contract will only afford accommodation for half that number. Mr. J. D. Webster is the architect for the church, and Messrs. George Longdon & Son are the contractors.

Correspondence.

To the Editor of THE BUILDER.

PORTLAND CEMENT.

SIR,—The article in your last issue is very interesting, and so is a recent illustrated "Note" on the chemical action involved in the setting of the cement.

What architects particularly want is not so much great strength in cement as freedom from expansion and contraction. Recently it has been my experience, as well as that of others engaged in similar practice, that in the construction of floors of coke breeze concrete, freely exposed underneath and covered with a wood floor above, there has occurred at intervals of ten to twenty months after setting an expansion, in long floors, sufficient to cause fractures in the walls. These walls are internally plastered and examined, so that it is known that the expansion does not take place earlier. It is not the expansion due to slaking or setting, nor can it be said to be due to the temperature of the set and solid mass, as it has been observed in concrete which was set at the initial atmospheric temperatures of 40 to 75 deg. Fahr. Some that was set at 40 deg. expanded that long time after at 75 deg.; while some that was set in the hot weather expanded in the cold. The cement was cooled by aëration and tested for soundness before use, but not for strength.

If your scientific contributors could throw any light on this mysterious subject they would do great service to many of your readers. My own impression is that the future tendency will be towards the separation and exclusive use of the "*flour*" of the cement, and the rejection of *all residue*. CEMENT USER.

The Student's Column.

GAS AND GAS FITTINGS:

3.—PURIFICATION OF COAL GAS.

CONDENSERS.—The temperature of the gas as it leaves the main is usually about 130 deg. Fahr., or as it leaves the foul main about 125 deg. Fahr., and in order to cool it to atmospheric temperature the gas is led from the foul main through the condensers. These may be either vertical or nearly horizontal (fig. 4) pipes. They are exposed to the open air, and if of the horizontal form, may be cooled in hot weather by being sprinkled with water. The condensers in use vary greatly in size and form, but are all provided with means for drawing off the tar and ammoniacal liquor which condenses in them. Very rapid cooling is found prejudicially to affect the quality of the gas, and no attempt is made to cool it below the atmospheric temperature.

Exhausters.—The gas leaving the condensers usually passes next to an exhauster. The exhauster is a description of pump which draws the gas (through the hydraulic main and condensers) from the retorts, and prevents the gas from accumulating under pressure in them; while the gas as it passes through the exhauster is so compressed that it issues from the outlet at a pressure sufficient to enable it to force its way through the washing and purifying apparatus and station meter, and to lift the bell of the gasholder.

Washers and Scrubbers.—After removing the condensable matter from the gas by passing it through the condensers, the gas as it leaves the exhauster is led to the washers and scrubbers where it is washed and scrubbed in order to remove as far as practicable all the soluble impurities.

The term "washer" is usually applied to a rectangular tank in which the gas bubbles through the liquid washing agent, while the term "scrubber" is applied to the vertical tower in which the gas filters through a bed of material having its surfaces maintained in a moist condition. The term "washer-scrubber" is applied to an apparatus in which both washing and scrubbing are effected. The three terms are, however, sometimes used indiscriminately.

In the washers the gas is washed in the ammoniacal liquor obtained from the hydraulic main and condensers, as this liquor may be made to retain a further quantity of the impurities remaining in the gas. To this liquor

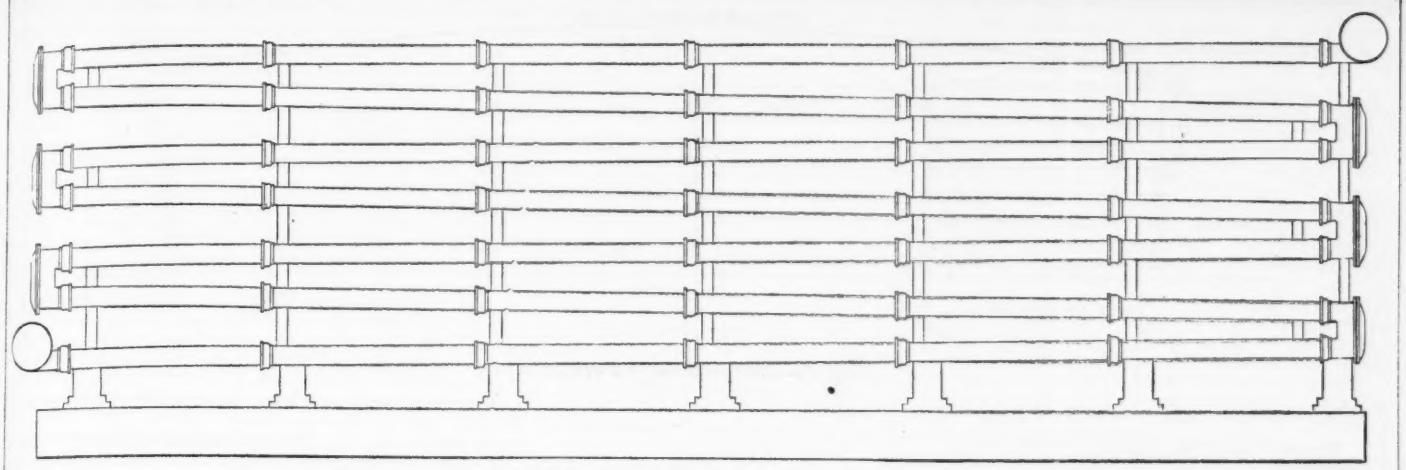


Fig. 4.—Horizontal Condenser.

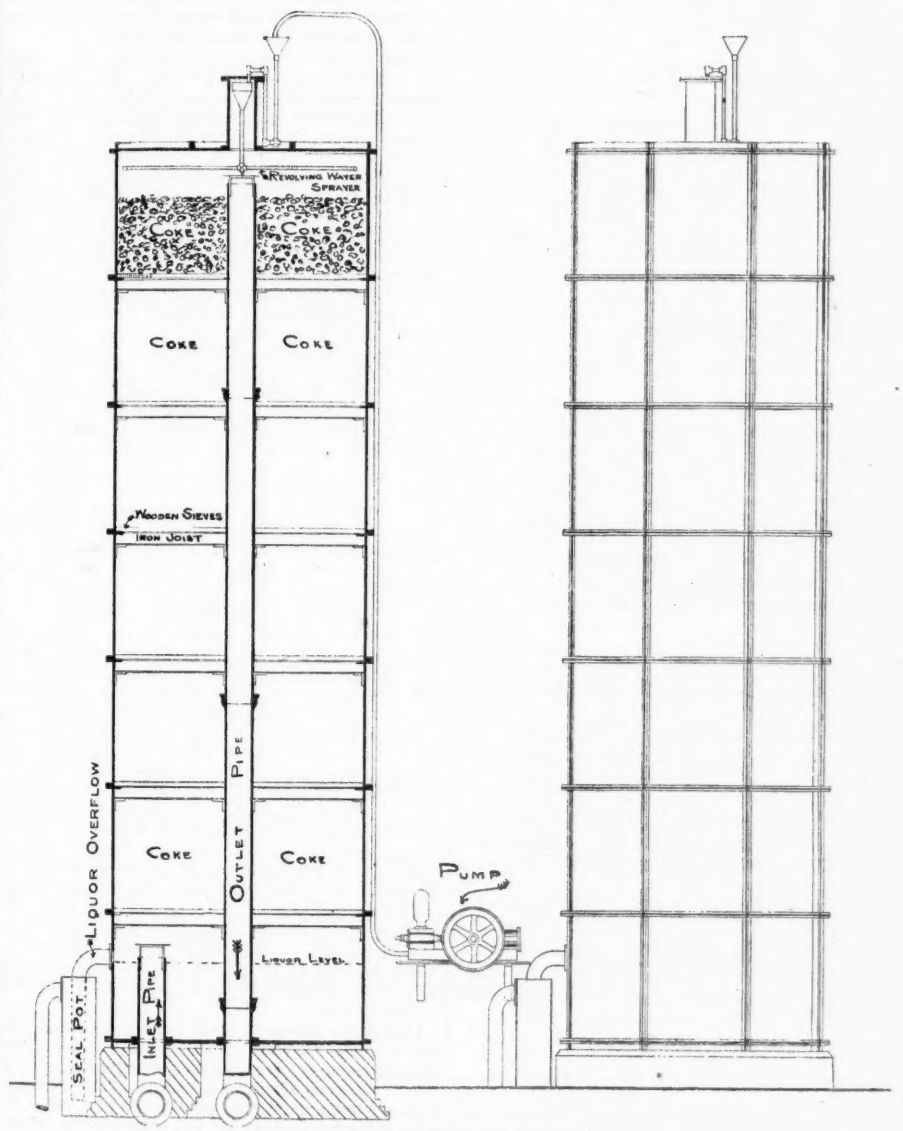


Fig. 5.—Set of Scrubbers.

may be added the weakest liquor from the scrubbers. The washers used in many works are rectangular tanks fitted with a number of perforated trays immersed in the ammoniacal liquid. The volume of gas is broken by being admitted through perforated tubes and by contact with the trays, and rises in small bubbles through the liquor. In the washers the remaining portion of tar is extracted from the gas, hence the washers are sometimes termed "tar extractors." In other cases a specially constructed "tar extractor" is put in action before the washers. From the washers the gas passes to the scrubbers, where with the aid of weak ammoniacal liquor and finally of clean water the ammonia still remaining in the gas together with a quantity of other soluble impurities is removed.

The scrubber towers (fig. 5) are usually filled with coke down which water is allowed to trickle. The gas flowing upwards meets the descending water and parts with its ammonia. In more modern scrubbing appliances washer-scrubbers having circular brushes or a series of perforated discs attached to a central shaft are made to revolve at a slow speed and cause the water to come into intimate contact with the gas. The object of all washing and scrubbing devices is to remove the ammonia from the gas with the use of as little water as possible, for the greater the quantity of ammonia in the "gas liquor" obtained, the greater is its value for the purpose of manufacturing sulphate of ammonia.

Purifiers.—After leaving the scrubbers the gas still contains a certain quantity of sulphuretted hydrogen, carbon dioxide, and carbon bisulphide, which should be removed.

The carbon dioxide (commonly called carbonic acid) is abstracted by passing the gas through slaked lime, carbonate of lime being formed (fig. 6). The sulphuretted hydrogen may also be removed by slaked lime, but the sulphur in the lime compound produced cannot readily be recovered, and the compound itself possesses such an obnoxious odour that its production in large quantity in any residential neighbourhood is liable to be resented. The sulphuretted hydrogen is therefore now usually removed by passing it through hydrated oxide of iron to which sawdust has been added to render the oxide more porous. The sulphide of iron produced is decomposed when allowed contact with air into oxide of iron and free sulphur, and before being permanently put out of action the oxide is several times turned out of the purifiers and exposed to the atmosphere for revivification. The free sulphur can be employed without difficulty for the manufacture of sulphuric acid, and is therefore a residual of considerable value. The "spent oxide," as it is called, has also the advantage of emitting a less objectionable odour than lime which has been saturated with sulphuretted hydrogen.

The carbon bisulphide has no affinity for slaked lime, but slaked lime which has been saturated with sulphuretted hydrogen readily abstracts it from the gas. The carbon bisulphide is therefore removed by passing it through lime which has been "sulphided" on the works.

The scheme usually adopted for the dry purification is the following:—The gas from the scrubbers enters a set of purifiers containing slaked lime spread in layers upon wooden grids. The carbon dioxide and the sulphuretted hydrogen are at first both abstracted by the lime, a mixture of carbonate of lime and hydroxyhydrosulphide of lime being formed. But carbon dioxide is able to decompose hydroxyhydrosulphide of lime [CaOHSH], driving out the sulphuretted hydrogen and itself combining with the lime to form carbonate of lime. When, therefore, the gas containing both carbon dioxide and sulphuretted hydrogen does not meet with sufficient free slaked lime to readily satisfy all the carbon dioxide, the carbon dioxide begins to attack that portion of the lime which has been combining with the sulphuretted hydrogen, and turning out the sulphuretted hydrogen, sends that impurity forward again with the gas, and itself combines with the lime. The carbon dioxide is therefore retained in the first set of lime purifiers, while the gas still containing sulphuretted hydrogen, but not carbon dioxide, passes forward to a second set of lime purifiers. Here the sulphuretted hydrogen is able to combine with the lime undisturbed by the presence of carbon dioxide. When the second set of purifiers is sufficiently charged with sulphuretted hydrogen these purifiers are employed to purify the gas from carbon bisulphide, while the sulphuretted hydrogen which still continues to come forward is removed by passing the gas through a third set of purifiers containing hydrated oxide of iron. In some cases, after the sulphide purifiers have been prepared, the purifiers containing oxide of iron are brought into action between the carbonic acid purifiers and the "sulphide" vessels, so that the gas passes first through the lime purifiers, which remove the carbon dioxide, then through the oxide of iron purifiers, which remove the sulphuretted hydrogen, next through the sulphide purifiers, which remove the bisulphide of carbon, and, finally, through another oxide of iron purifier, termed "the check box," which removes the small quantity of sulphuretted

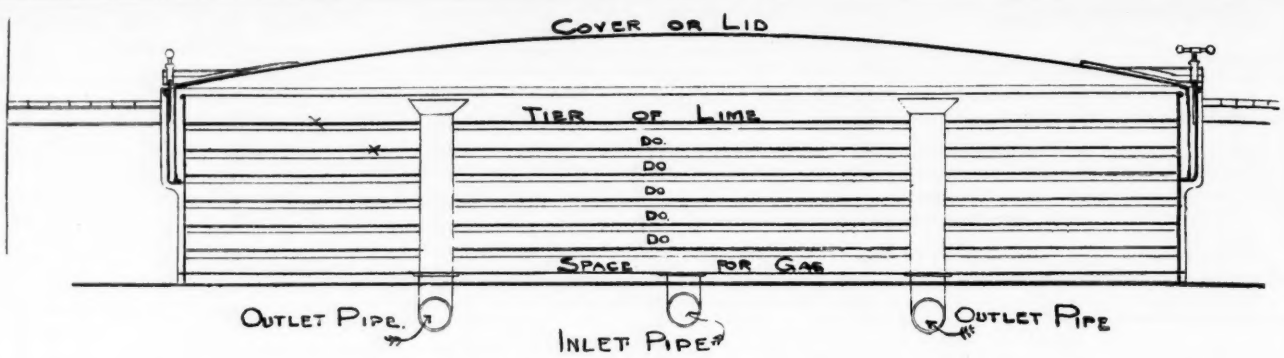


Fig. 6.—Section through Purifier.

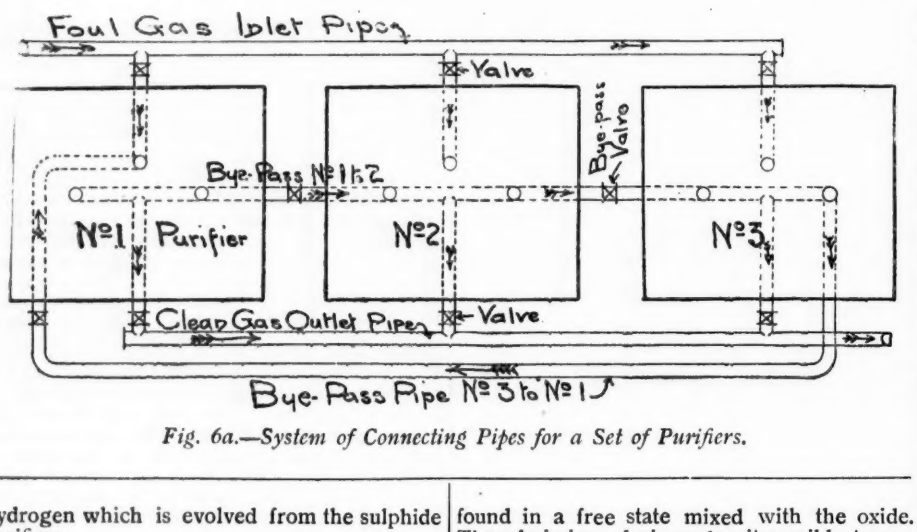


Fig. 6a.—System of Connecting Pipes for a Set of Purifiers.

hydrogen which is evolved from the sulphide purifiers.

Many years ago "milk of lime" was used for gas purification, and the waste product acquired great notoriety under the name of "Blue Billy" on account of its horrible odour. Owing partly to the difficulty of disposing of the waste material, the liquid paste has long been superseded by the comparatively dry hydrate of lime, which when "spent" has a somewhat less foul odour, and can be reburnt on the works and used again for purification, or, after long exposure to the air, can be carted away for agricultural purposes without attracting undue attention by its perfume.

Many gas manufacturers do not purify the gas so thoroughly as it has to be purified in London. In many cases no attempt is made to remove the carbon bisulphide, but by Act of Parliament all gas supplied to consumers must be free from sulphuretted hydrogen, and consequently this impurity is, as a rule, removed as completely as possible. The carbon dioxide is also usually more or less completely removed, because it prejudicially affects the illuminating power of the gas. One per cent. of carbon dioxide in the gas reduces its illuminating power about 4 per cent.

Mixing Air with the Gas.—When consumers of gas make the discovery that air is being deliberately added to the gas passing into the purifiers, they in many cases imagine that the air is being added to serve as an adulterant. Now the presence of 1 per cent. of air in the purified gas diminishes its illuminating power by about 6 per cent., 4 per cent. of air reduces the illuminating power 25 per cent., and 45 per cent. of air causes the gas to burn with a non-luminous flame. It is evident, therefore, that air cannot in practice be used as an adulterant, for its presence in any appreciable quantity would be at once apparent even to the untrained eye when the gas was used as an illuminant.

The fact is that a quantity of air not exceeding 3 per cent. of the gas purified is in some works let into the purifiers to oxidise the sulphur compounds of lime or iron which are formed there, but the atmospheric oxygen is all abstracted by the material in the purifiers before the gas passes from them. The atmospheric nitrogen passes forward with the gas, but is too small in quantity to exert much influence. Usually the proportion of air admitted is limited to a maximum of 1½ per cent.

In oxide of iron purifiers the oxygen of the air attacks the sulphide of iron formed by the action of the sulphuretted hydrogen on the iron oxide, and re-converts it into oxide of iron, while the sulphur displaced by the oxygen is found in a free state mixed with the oxide. The admission of air makes it possible to use the oxide for a longer period before it is necessary to turn it out and expose it to the atmosphere for more complete revivification. In fact the oxide need not be revivified in the open air until some 25 per cent. of its weight consists of free sulphur. The use of air in the purifiers also diminishes the odour emitted by the spent material when first exposed to the open air.

In lime purifiers air is often admitted when the scheme adopted for purification from sulphur compounds is different from that previously described. About 1½ per cent. of air is admitted to partially sulphided lime purifiers, the oxygen oxidises the sulphur compounds of lime, and free sulphur often amounting to 10 per cent. is found in the spent lime. Spent lime from purifiers to which air has been admitted creates less nuisance than spent lime from sulphide purifiers from which air has been excluded.

Other schemes and other substances have been adopted for gas purification, but lime and hydrated oxide of iron used in a manner more or less approximating to the system here delineated are employed more extensively than any other materials.

GENERAL BUILDING NEWS.

CHANCEL RESTORATION, HALES CHURCH, NORFOLK.—The ancient Church of St. Margaret, Hales, has recently undergone further restoration, the chancel having just been restored. The old box pews have been removed, and oak benches with carved panels have been erected, and the floor has been raised and relaid with black bordered tiles. A new oak prayer desk has also been provided, and the pulpit repaired and remodelled. The choir, who formerly sat in the west gallery, will in future be accommodated in the new seats in the chancel. The seats were supplied by Mr. C. W. Brown, of Norwich, and the structural work was carried out by Messrs. Chaston & Grimson, of Loddon, and Mr. A. W. Perfitt, of Long Stratton, was responsible for the stonework. The whole of the work was carried out under the direction of Mr. H. J. Green, diocesan architect.

HOLY TRINITY CHURCH, ISLINGTON.—In response to a petition made by the vicar and churchwardens of Holy Trinity Parish Church, in Cloudesley-square, to the Consistory Court of London, Dr. Tristram, K.C., Chancellor of the Diocese, has agreed to issue a faculty for effecting some extensive improvements and alterations of the interior of the church. It is proposed to remove the high-backed pews; to take down the north and south galleries, enlarge the west gallery, and substitute open pews throughout; to raise (by 7 in.) the east end with the choir and chancel, so as to make one step for the Communion-table; to instal electric light, with certain other minor changes, at an estimated cost of 3,000*l.*, towards which sum 1,000*l.* is already provided. The church was built in 1826-7, after Sir Charles Barry's designs, of brick with stone dressings and tracery in the rather Late Gothic style that was prevalent at the time.

NEW CHURCH, DURRUS, CORK.—A new church was recently dedicated at Durrus. The plan of the church consists of nave, chancel, aisles, side chapels, porches, baptistry, sacristy, and organ gallery. The principal dimensions are, in the interior—length of nave and chancel, 101 ft.; breadth of nave and aisles, 45 ft.; height to ridge of nave, 40 ft. The aisles on either side are separated from the nave by five bays, forming the main arcades, which are carried by limestone pillars, with mounded caps and bases, and pointed arches, above which is the clearstory cinque foil lights. The chancel is divided from the nave by a chancel arch, springing from polished marble columns, and Bath-stone corbels and caps, all carved and moulded. The aisles are buttressed on the exterior, and are lighted by three-light pointed lancets, arranged in groups, to each bay. The roof of the nave is in pitch-pine. The chancel roof is divided into several panels by moulded ribs and the panel spaces are plastered to admit of future decoration. The porches leading to the aisles at either side and the sacristy are gable-roofed. The work has been carried out from the plans of Mr. M. A. Hennessy, architect, Cork, and the main contract was by Mr. D. Donovan, of Bantry. The high altar is by Mr. Davis, sculptor, Cork; the lead lights by Messrs. Watson, of Youghal; the iron work by Messrs. M'Gloghlin, of Dublin; and the bell by Byrne, of Dublin.

WESLEYAN CHAPEL, STAPENHILL, BURTON.—The trustees of the Wesleyan Chapel at Stapenhill have accepted the estimate of Messrs. Thos. Lowe & Sons at 2,240*l.* for the erection of a new chapel and school buildings in Ferry-street The chapel, which is designed in the Early English style, provides accommodation for 400 adults, and consists of a central aisle and two transepts, with entrance vestibules. The north transept is designed to accommodate the organ. The school will contain 300 children, and in connexion therewith are cloak-rooms and lavatories. At the back of these buildings are provided vestry, kitchen, and heating chamber, &c. The work will be executed in red brickwork and white stone dressings, the main feature of the chapel font being a large four-light tracery window. The whole of the roof timbers inside will be of pitch pine and will be exposed, being stained and varnished. The architect is Mr. Thomas Jenkins.

CATHOLIC CHURCH, SITTINGBOURNE.—The foundation-stone has just been laid of a new Catholic church, to be known as the Church of the Sacred Heart of Our Lord Jesus Christ, the site being adjacent to the Presbytery, in West-street. The tower will be open within the nave, on one tall and two short arches; the rest of the area will be quite free from all obstruction. The chancel is to be divided by an arch, and will be apsidal in form. A small vestry is also included in the plan. The northern entrance will receive full enrichment, and on either hand and above it is proposed to place statuary in niches. The architect is Mr. W. Leonard Grant, of Sittingbourne.

ENLARGEMENT OF GOVAN SCHOOL.—An addition has been made to Albert-road School, Pollokshields, for the Govan Parish School Board. Accommodation is provided on the ground floor of the new building for a chemical laboratory, lecture-room, and also a physical laboratory and manual workshop. On the upper floor are art rooms. There are also a cookery-room and some other rooms, which will be used in the work of the school. There are separate cloak-rooms and lavatories. The school is heated by low-pressure hot water, with radiators, and fitted throughout with electric light. The Board has under consideration a proposal to erect a small astronomical observatory on the roof, in which a large telescope, the gift of a member of the Board, will be fitted up. The school was built from plans prepared by Messrs. H. & D. Barclay, architects, Glasgow, under the supervision of Mr. Samuel Preston, the Board's master of works.

BOARD SCHOOLS, GLYN-NEATH, WALES.—The foundation-stone of new Board schools was laid at Glyn-Neath recently. The new building will provide accommodation for 320 children, and it comprises a central hall and five classrooms with board-room and teachers'-room on the first floor. It is intended to be used as a mixed school, and the cost is 3,479*l.* The building is of brickwork, faced with Morriston pressed bricks and relieved with strings of blue brick and Bath stone dressings. The floors are of pitch pine wood blocks with matchboarding dados. The contractor is Mr. David Davies, of Cardiff; the architect, Mr. J. C. Rees, of Neath; and the clerk of works, Mr. D. Richards, of Glyn-Neath.

SCHOOLS, BRECON.—Two intermediate schools in the borough of Brecon—one for 80 girl students and the other for 100 boys—were opened recently. The schools have been erected, furnished, &c., at a cost of 6,715*l.*, the architects being Messrs. Phillips & Baldwin, of Cardiff and Abergavenny, the builder Mr. E. G. Groom, Llandovery, and the clerk of the works Mr. C. J. E. Large, Brecon.

INFECTIOUS HOSPITALS FOR RADCLIFFE AND DISTRICT, LANCASHIRE.—Mr. S. W. Wheaton, an inspector of the Local Government Board, held an inquiry at the Assize Courts, Manchester, on the 9th inst., into an application made by the Lancashire County Council for sanction to the borrowing of 40,000*l.* for the provision by the Radcliffe, Ramsbottom, Whitefield, and Bury Joint Isolation Hospital Committee of an infectious diseases hospital and a smallpox hospital on land at Ainsworth. Dr. Sergeant, Medical Officer to the County Council, said it was proposed to erect two hospitals on one site at Ainsworth. The site was about fifty acres in extent. There would be fifty-six beds in the infectious diseases hospital and thirty-two in the smallpox hospital. Mr. H. Lord, architect, of Manchester, said the estimated cost was 34,164*l.*, the amount allowed for contingencies was 3,416*l.*, architect's charge (which included clerk of works), 2,420*l.*, making a total of 40,000*l.* There would be bedrooms for eleven nurses in the infectious diseases hospital, and eight bedrooms for nurses in the smallpox hospital, with dining-room, &c., and offices. There was no opposition to the scheme.

BATHS, WANDSWORTH.—New public baths were recently opened at Wandsworth by the Mayor. The requisite bath accommodation has been provided on the ground floor. Separate entrances have been provided for the men's and women's baths, the ticket office being placed between each. There are six first-class private baths for men, and sixty of the second-class; four first-class private baths for women, and eight second-class. Each of the four sets or groups has a waiting-room, lavatory, &c., and is complete in itself. The first-class bath is 100 ft. long by 30 ft. wide; the second-class bath is 85 ft. long by 30 ft. wide, and contains seventy-two dressing-boxes. A room for the storage of bicycles is provided. The total cost of the works has been about 36,000*l.* The contract has been executed by Mr. Walter Wallis, of Balham, and Messrs. Spalding & Spalding, of Queen-street, E.C., are the architects

NEW HOTEL, HUNSTANTON.—A new hotel has been erected at Hunstanton from designs by Mr. H. J. Green, of Norwich, and built by Messrs. Giddens & Perrin, of St. Ives.

SAILORS' HOME, LONDON.—The foundation-stone of the new headquarters for the British and Foreign Sailors' Society was laid recently. It will be situate at the junction of four main highways—East and West India, Commercial, and Burdett-roads. On the ground-floor there will be the American room, suitably fitted as a sailors' temperance restaurant, and smoking and attendant's-rooms adjoining. In the basement are the kitchen and store-room departments. The first-floor (reached by the main staircase) will be for the general offices, board-room, library, and literature departments. The second-front flat will comprise officers' and apprentices' rooms, with parlour, sleeping accommodation, and bath-room. The next floor will contain navigation-room, leading up to the observatory, with rooms for the superintendent and workers. The main entrance will lead through a corridor into the Albert Victor Sailors' Rest in the Gill-street side of the home. Above the hall, with another entrance from Gill-street, are dormitories for seamen, with bath and lavatories complete. Messrs. Niven & Wigglesworth, are the architects.

IMPROVEMENTS AT THE THEATRE ROYAL, SHEFFIELD.—During the summer closing of the Sheffield Theatre Royal some alterations and improvements are to be made. The stage is to be enlarged by taking in a good deal of space at the back. The electric light is to be introduced. New dressing rooms, also, are to be built. The alterations are being made under the superintendence of Mr. Frank Matcham.

NEW PIER PAVILION, DOVER.—On the 15th inst. the new Pavilion on the Promenade Pier was opened to the public. It consists of a concert hall, 85 ft. by 50 ft. with seating accommodation for about 950 persons. Dressing rooms, refreshment bars, shop, and pier master's room are also provided in the building. The hall is roofed in one span with semi-circular steel trusses carried down to the pier girders, and there are no columns to obstruct the view of the platform. The cost of the scheme, which includes the revising and strengthening of the understructure of the pier, has been about 6,600*l.* The work was executed in seven months by Messrs. Anthony Fasey & Son, of Leytonstone, from the plans and under the superintendence of Mr. M. Noel Ridley, engineer, and Mr. Robert J. Beale, architect, whose joint design was selected in competition.

PARISH CHURCH HALL, ST. ANDREWS.—It is proposed to erect a parish church hall at St. Andrews. It will have a frontage to the south and will have a vestibule at the south end, with a staircase to a gallery over, and a platform at the north end. The adjuncts consist of a classroom for bible class, minister's-room, retiring-rooms, and a kitchen for use at social meetings, with the usual lavatory accommodation. The height of the hall will be 15 ft. to the wall heads and 26 ft. to the ceiling. The exterior walls will be of local freestone, and the roof will be covered with green Scotch slating. The hall will provide accommodation for over 400 scholars. Messrs. Gillespie & Scott, St. Andrews, are the architects, and the following are the contractors:—Mason work, Mr. Thomas Liddell; joiner work and seats, Mr. Andrew Cunningham; slater work, Messrs. Rintoul & Mackie; plumber work, Mr. Thomas Peebles; and plaster work Mr. A. R. Macpherson—all of St. Andrews.

ASSURANCE COMPANY'S NEW BUILDINGS, PERTH.—The new buildings in Perth which have been erected by the General Accident Assurance Corporation, Limited, occupy the site of the old post office. The principal entrance is from High-street, and leads into the general office, which occupies nearly the whole area of the ground floor. The office is seated for about 100 clerks. On this floor there are also assistant manager's room, rooms for the heads of the departments, telephone room, and post office. Marble pillars support the second floor. At the back of the general office is a service stair running from the basement to the top floor, with an electric lift for the staff. The clerks' entrance is from Tay-street. On the mezzanine floor the lady typists' room is situated. From the general offices rises the grand staircase. It is constructed of Sicilian marble and wainscot oak. At the foot of the stair is a marble arch, with two modelled bronze figures. The windows on the stair are by Messrs. Ballantine & Gardiner, Edinburgh. They represent England, Scotland and Ireland, with the conventional treatment of the rose, the thistle, and the shamrock. In the centre are the arms of the City of Perth, supported on either side by those of the Chairman and Sir R. D. Moncreiffe. On the first-floor landing is the fire department, seated for between forty and fifty clerks. The general manager's room, board-room, and ante-room are situated on the same floor; but are cut off from the main staircase by a private entrance and lobby. There is also the keeper's house of three apartments. The top flat is used for storage purposes. There is an extra clerk's room on the second floor seated for about sixty clerks, and a clerk's luncheon-room. In the basement are storerooms and packing-rooms, heating chamber, workshop, and three fire and burglar-proof safes, which are reached by a stair from the general office. The following were the contractors:—Masons, Messrs. R. Brand & Sons, Perth; joiners, Messrs. J. Hay & Son, Perth; plasterer, tiles, and paving, A. M'Ritchie, Dundee; plumber, James M'Leish, Perth; slaters, Messrs. J. Buchan & Son, Perth; painters, Messrs. Stalker & Boyd, Perth; special decorators and furnishers, Messrs. Cowton & Sons, London; heating and ventilation, Messrs. James Simpson & Co., London; electric bells, Messrs. Westwood & Co., Perth; electric lighting, Messrs. Frew, Watson, & Co., Perth; marble work, Mr. Thomson, Princes-street, Perth, and Messrs. Galbraith & Winton, Glasgow; stone-carver, William Sheriff, Glasgow; wood-carver, John Crawford, Glasgow; iron work, Messrs. Mather & Son, Edinburgh; glaziers, Messrs. G. R. Douglas & Son, Perth; electric hoist, Messrs. A. & P. Steven, Glasgow. The architect was Mr. G. P. K. Young, of Perth; and the inspector of works, Mr. G. Henderson, Perth.

WORKMEN'S HOME AND CLUB, LIVERPOOL.—According to the *Liverpool Post*, buildings are being erected in Liverpool by Mr. B. W. Levy out of the moneys of the David Lewis Trust Fund. The object to be achieved is the provision of a Workmen's Home and Club and Public Hall, somewhat on the lines of the People's Palace in London. The site is the land upon which old St. James's Market stood, and it has its main frontage in Great George-place, its side fronting to Nile-street, and its back in Rathbone-street. The cost, it is stated, will run to close on 50,000*l.* Mr. J. Francis Doyle is the architect, from whose designs and under whose superintendence the building is being erected. The main frontage to Great George-place will extend to 174 ft. The side frontage in Nile-street will have a length of 146 ft. In all, the site of land embraces 220 ft. by 176 ft., and the buildings will be set back irom the boundary some 21 ft. The materials used in the facing of the main outer walls will be of special brick and terra cotta, with green slates on the roof. The main entrance to the public hall and clubroom will be from Great George-place, and will be 12 ft. wide. This means of ingress will have a hall 50 ft. by 20 ft., arched and finished in tiles and faïence. In regard to the public hall, which will be 90 ft. by 42 ft. and 35 ft. high, it will be in the centre of the building, and will accommodate upwards of 800 persons. It will have a separate stage entrance from Rathbone-street, stage boxes, gallery, and green-rooms for both sexes. All the staircases and floors will be fireproof. Respecting the social club, it is arranged that this shall consist of a number of large rooms—a billiard-room, 67 ft. by 30 ft.; two committee-rooms, three social clubrooms, each 50 ft. by 26 ft., and also a special clubroom and toilet facilities for females. To the south of the clubroom, on the same site, space is left open for the subsequent erection of a gymnasium, 132 ft. by 54 ft. The Home will be approached and entered from Nile-street, off Great George-street, through turnstiles. Just over the threshold the visitor will find himself at the office, and adjacent to this will be the master's house. The reading-room will be 50 ft. by 20 ft. In a central position between this room and the dining-room, with an area of 20 ft. by 15 ft., will be the provision shop. There will be lifts connecting the shop with the kitchens in the basement. The dining-room will be 80 ft. by 41 ft. The kitchens, sculleries, pantries, and stores will be in the basement. In the basement will also be lockers, and storerooms for the accommodation of the things belonging to the boarders at the Home. On the upper floors, approached from the large main staircase by three independent gangways, will be the sleeping cubicles. These will be arranged in groups for easy working and control. There will also be two other stone staircases for exit in cases of necessity. The number of cubicles for which arrangements have been made in the designs is 381. Over the billiard-room will be a flat roof, which it is intended shall be for the use of the men who sleep in the Home. The work of erection has been entrusted to Mr. Isaac Dilworth, the clerk of the works being Mr. J. W. Gilling.

HOTEL, SOUTHWOLD.—The Grand Hotel, Southwold, was opened on the 10th inst. The site chosen is at the extreme end of the town, in close proximity to the pier, which was opened to the public last summer. The hotel consists of a main block, nearly 140 ft. in length and of five stories in height. The building was designed by Mr. C. H. M. Mileham, of Lincolns Inn-fields. The contractors were Messrs. Kerridge & Shaw, of Cambridge.

FOREIGN.

FRANCE.—The Municipal Council of Paris have approved of the erection of a statue of the Empress Josephine, by M. Vital Dubray, on the rond-point of the Cours-la-Reine; and also of a statue to Verlaine in the Square des Batignolles.——The Council has also decided on the erection, on the Place Dupleix, of a large building for the accommodation of workmen's syndicates, under the name of the "Palais du Travail." M. Philippon is the architect, and the cost will be about 675,000 fr. —— M. Ferret, Departmental Architect at Bourg, has been appointed President of the Société Regionale of Architects of the Saône.——Important public works, at an estimated cost of 388,000 fr, are to be undertaken at Montauban. They include the clearing away of the houses round the church of Saint Jean, and the restoration of the Hôtel de Ville and of the Hôtel Bonnecaze.——A sum of 26,000,000 fr. is to be expended on the enlargement of the port of Dunkerque.——Before separating at the close of the session, the Council of Paris passed a vote for the purchase of works from the two Salons. Among these are the "Reveil," by M. Jacques Blanche; a portrait, by M. Aman Jean; "La Terre Antique," by M. Ménard; "Devant la Mer," by M. Jean Boucher; "L'Enigme," by M. Moncel; a bronze lion, by M. Cordier; works in pewter by M. Baffier; a fine cameo by M. Tonnelier, &c. The total value of the purchases amounts to 114,200 fr.——M. Germain, the sculptor, has just completed the models for four electric candelabra which are to complete the decoration of the façade of the Opéra Comique. These consist of heavy columns of red Scotch granite, adorned with bands and olive branches of hammered bronze. These carry four branches, each with three electric globes.——In the Section of Architecture, at the Académie des Beaux-Arts, M. Batigny, architect, of Lille, has been appointed a corresponding member in place of the late M. Révoil.——The Paris Council has decided to continue the large intercepting sewer from Clichy, which now ends at the Place de la Trinité, as far as the Rue des Petits Champs. The operation will cost about 1,370,000 fr.——The death is announced, at the age of seventy-one, of M. Edouard Krug, painter, author of numerous religious and allegorical pictures. He exhibited, a few years ago, an immense canvas in which were grouped all the persons, Norman and Bretonne, who are members of the Society called "La Pomme." He obtained medals in various salons, and a bronze medal in the great exhibition of 1889.——M. Albert Alexandre Vergnon, architect, of Paris, has died at the age of fifty-four. He was a pupil of the atelier André.

GERMANY.—A monument erected to the memory of the late Emperors William and Frederick was recently unveiled at Soran, in Silesia. It consists of two statues of the emperors mounted on pedestals; they are represented as being in the uniforms of Prussian generals. The monument is about 20 ft. in height.——A tower erected to the memory of Prince Bismarck, at Coburg, was recently unveiled

in the presence of Princess Beatrice and the Prince Regent of Saxe-Coburg and Gotha.

AUSTRIA.—A statue representing the late Empress of Austria was unveiled at Salzburg on the 15th inst. in the presence of the Emperor and several other members of the Austrian Royal Family. The statue, of white marble, is by Professor Hellmer, and depicts her late Majesty when in her prime. It stands on a low pedestal, the front of which bears the simple inscription, "Elizabeth, Empress of Austria," whilst the sides are adorned with verses by the Austrian poetess, Marie Ebner von Eschenbach.

ITALY.—It is reported from Rome that in the course of the restoration work in the Palace of the Duke of Massa Carrara, at Carrara, there have been discovered two magnificent frescoes by Raphael. These frescoes fill two large spaces of the wall in an apartment in the building.

SANITARY AND ENGINEERING NEWS.

NEW SEWERAGE WORKS, LONDON COUNTY COUNCIL.—The London County Council propose to acquire by compulsory sale thirty-six acres of land in the parishes of Erith and Plumstead for the construction, as part of the main drainage and sewerage of the Metropolis, of two outfall sewers, one of them to be below ground and the other above ground covered with an earthen embankment, so as to provide for the increasing flow of sewage from the area lying on the south side of the river Thames.

PLUMBERS' REGISTRATION.—The House of Lords has given a first reading to a Bill introduced by Lord Glenesk entitled "An Act for the Registration of Plumbers." It was set down for second reading on Thursday, and there was no notice of opposition. This measure, of which Lord Glenesk is taking charge, is similar in substance to those read a second time in the House of Commons in 1892 and 1897 and reported on by a Select Committee and the Standing Committee on Trade in those years respectively. The object, of course, is to establish a system under which plumbers can, if they please, be registered. No privilege is proposed to be given by the Bill to registered plumbers, but a plumber is prohibited from calling himself a registered plumber unless he is registered under the Bill. It will be necessary for a plumber before he is registered to be qualified to the satisfaction of a council approved by the Local Government Board. This will enable persons employing plumbers to satisfy themselves, if they desire to do so, that the persons they so employ have given evidence of their qualification for the work. The control of the registration system and the selection of qualifying examinations will be in the hands of a general council constituted under a scheme to be framed by the Local Government Board, and consisting of members representing master and operative plumbers, Local Authorities, and various sanitary associations. Sub-section 5 of Clause 3 provides that "Any scheme made under this Act shall be laid before both Houses of Parliament as soon as may be after it is made, and if, within the next subsequent forty days on which either House has sat that House presents an address to his Majesty praying that any such scheme may either in whole or in part be annulled, his Majesty in Council may annul the same either in whole or in part as the case may require, and the scheme or part annulled shall thenceforth become void without prejudice to the validity of any proceedings taken under the same in the meantime. If the first scheme framed by the Local Government Board is so annulled, the Local Government Board shall within ——— months frame a further scheme, and so on as occasion requires."

MISCELLANEOUS.

FERRY WORKS, QUEENSFERRY.—Mr. Bulkeley Creswell, the architect of this building, illustrated in our last issue, writes to ask us to correct the spelling of his name, which we gave as "Cresswell." We may say, what applies to this and other cases, that mistakes as to the spelling of a name often arise from correspondents not taking the trouble to write their signature clearly.

ST. MARY CHURCH, HARROW.—A faculty has been granted by the Consistory Court of London in respect of the parish church, Harrow-on-the-Hill. The faculty authorises the re-building and enlargement of the organ that is now in the north chapel, the making of a new window (to be filled with stained glass) in the clear-story above the archway (inserted at the end of the thirteenth century) that opens from the north aisle into the north transept, similar to the seven other clear-story windows, and the refitting and reglazing of the lancet windows in the south side of the chancel, five of which were found and restored during the recent remodelling of the east end of the church. The faculty will also provide for the shifting of some of the monuments and memorial tablets, amongst them being the monument erected in 1609 to William Gerard and his sister. For particulars of the clear-story and of the Early English windows in the chancel, see our leading article of January 26, 1895.

ST. GILES'S CHURCH, CRIPPLEGATE.—A faculty has been granted by the Consistory Court of London for carrying out some alterations of the church, to include the erection of a porch and the setting up at the east end of the north aisle of the reredos formerly in the church of St. Bartholomew, Moor-lane, which is now being demolished. In the reredos are panels with the Ten Commandments upon them; for these will be substituted a picture of the Presentation of Christ in the Temple, and the Ten Commandments will be put at the west end of the church, there being no space for them in the customary place, which is occupied with monuments.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual summer excursion organised under the auspices of the Bristol Master Builders' Association took place on the 9th inst. Saloon carriages conveyed the party to Chippenham, which was reached soon after ten o'clock, and breaks were in readiness to take the party to Bowood Park. The drive through the richly-wooded country was very pleasant, and the seat of the Marquess of Lansdowne was much admired. The drive was continued to Avebury, with its historic stones and ditch, though these were left until luncheon had been partaken of. The drive to Lacock was most enjoyable, and through typical Wiltshire scenery. The visit to Lacock Abbey proved very interesting. A four miles journey brought the party back to the Angel Hotel, where the dinner was held. Mr. E. Walters presided, and the vice-chairs were taken by Messrs. G. Wilkins and G. Humphreys. After the usual loyal toast, Mr. W. H. Brown proposed the toast of "The National Federation of Building Trade Employers of Great Britain and Ireland," and said he had to associate with it the names of the well-known builders, Mr. A. Krauss and Mr. Frank N. Cowlin. The former was President of the National Federation, while Mr. Cowlin was the energetic treasurer of the South-Western Federation. Such associations as theirs filled a useful place in their trade, and they also provided them with enjoyable outings like they had had that day. Mr. A. Krauss, in reply, gave some particulars of the recent meeting of the Federation at Glasgow. It was his good fortune, as President of the Federation, to be received by the Lord Provost at the Exhibition, and he gave their Federation a hearty welcome. They were also shown over the municipal buildings, and there they saw a magnificent structure, such as they could not hope to have in Bristol. One result of the Glasgow meeting was that a fresh effort would be made to amalgamate with kindred associations, so that they should have a united body representing the United Kingdom. Some of those present might be invited to join the committee to go into that question, and he relied upon their loyal support. As they knew, there had been a call on behalf of the National Association, to which the North of England contributed 100*l.*, and he was very glad to have a cheque from Mr. Cowlin on behalf of the South-Western Federation for 62*l.*—Mr. F. N. Cowlin also responded, and said it gave him great pleasure to be treasurer of the South-Western Federation. That organisation had had a great many difficulties, but these had been surmounted, and he felt certain that in the future the Federation was going to be of great benefit to the trade in their district. When they regarded the comprehensive nature of the organisation of their employés, the necessity of such a federation as theirs was apparent. He looked forward to the time when their organisation would be so strong that they would be able to refer the regulation of various trades connected with their business to a joint committee of the employers and the trade-unionists, and under those circumstances he believed such a thing as a strike would be unknown. Such a body would be the solution of the difficulties which at present existed between capital and labour, and it would tend to restore English work to its proper place in the competition with the world. Mr. Geo. Wilkins proposed the toast of "The Visitors." Mr. G. H. Perrin and Mr. W. H. Jelly (Bath) replied to the toast. Mr. Geo. Humphreys proposed the toast of "The Chairman," and Mr. Walters made a fitting reply. The party returned by the 8.35 train from Chippenham, arriving in Bristol just before ten o'clock.—*Bristol Times.*

THE WEST FRONT OF PETERBOROUGH CATHEDRAL.—The funds for the memorial of the late Dean of Peterborough have come in so satisfactorily that the Cathedral Restoration Committee have given an order for the work of completing the restoration of the west front to be proceeded with forthwith. This includes the repair of the great central arch and gable, the two turrets flanking the same, and also the pointing pinnacles of the bell tower. It is hoped, therefore, that the scaffolding which has for more than four years disfigured the beauty of the grand old edifice will soon be removed. About 500*l.* are still needed.—*Daily News.*

TUSCAN COPPER AND LEAD: RESUMPTION OF WORKINGS. — Some highly important mining operations in lead and copper ores have recently been begun at Lanzi, near Campiglia, in the south of the province of Pisa. It is not a case of the discovery of new ores, for these mines were known to the Romans, as is witnessed by abundant tracings of their workings all along the copper veins, and they have also been somewhat fitfully worked under different owners during the present century. But the surprisingly rich and valuable nature of the mines has only now fully come to light. The property, which is some 1,350 acres in extent, was recently acquired by a London syndicate, and is now owned by a company styled "The Etruscan Copper Estates, Limited." The geological conformation of the estate is clay slate, overlain by a bed of marble of the average thickness of 400ft. The metallic resources of the property consist of five fissure lodes of phenomenal proportions, one of lead (sulphide of lead and zinc blende) and four of copper (sulphides of copper). Each one of the lodes is over 100 ft. wide, the lead lode being 110 ft. and one of the copper lodes as much as 130 ft. in width. This fact alone is sufficient to show that the quantity of ore available must be enormous. The lead and zinc ore is now being raised in considerable quantities and has the appearance of being rich in metal, but it is too early yet to give an estimate of the metallic contents of the vein, as the work so far has only progressed to a short depth. It is evidently the intention of the present owners to develop the mines on a large scale. New hands are being put on every week as room is made for them in the workings, and the engineer estimates that he will have 1,000 men at work in twelve months' time. None of the ores will be exported, the company having decided to erect large smelting works and themselves reduce all the ores to metal. The company's exports will all have to pass through Leghorn, the nearest convenient port of importance, and it is expected that that city will eventually benefit largely by this latest venture of British enterprise and energy in the Peninsula.

CAPITAL AND LABOUR.

BRADFORD BUILDING DISPUTE.—At the meeting of the Bradford City Council on the 9th inst., a recommendation of the Finance and General Purposes Committee was submitted that no works should be allowed to proceed under any Corporation contracts except at the standard rate of wages last mutually agreed upon between masters and workmen. Ald. Ratcliffe moved the adoption of the Finance Committee minutes, but reserved his right to vote against that portion given above. Ald. Wood seconded, with a similar reservation. Mr. Thos. Whiteley moved an amendment to the effect that the minutes be adopted, with the exception of the resolution alluded to, which Ald. Popplewell seconded. On a vote, the amendment referring the resolution back was carried by 43 votes to 22.

MASONS' STRIKE, BURTON.—The strike of the stonemasons of Burton was brought to a termination by the men resuming work on the old terms. In the early part of the year the men gave six months' notice for an advance in wages from 8½d. to 9½d. per hour, and certain alterations in the rules of working. As these were not conceded, they came out on strike at the commencement of the month. Negotiations have since been going on between the employers and the men. The masters held that the present state of trade did not justify any concession being made. The masters' society received a letter on the 9th inst. stating that at a meeting it had been decided to resume work on the rules of July 1, 1897.

TEES-SIDE JOINERS' DISPUTE.—A settlement has been effected in regard to the dispute between the Tees-side and Hartlepools Master Builders and the Tees-side and Hartlepools District of Carpenters and Joiners over the question of wages. The men ceased work about two months ago because the employers declined to advance their wages from 9d. to 10d. per hour. The masters offered ½d. per hour at the time, but the men refused to accept this. Since then there have been repeated negotiations between the two parties, with the object of coming to a settlement. Finally the masters advanced their offer to ½d. per hour, conditionally upon the men agreeing to an alteration of rules, stipulating that the rules in force in the Sunderland district should be adopted. This arrangement has been agreed to and a settlement has been effected. About 400 men altogether have been affected, the district comprising Stockton, Thornaby, Middlesbrough, and the Hartlepools.

LEGAL.

POINT UNDER THE LONDON BUILDING ACT, 1894.

THE case of the London County Council *v.* Ellis came before a Divisional Court of King's Bench, consisting of Justices Darling and Phillimore, on the 12th inst., on a motion on behalf of the defendant calling upon Mr. d'Eyncourt, the Metropolitan Police Magistrate, to show cause why he should not state a special case for the opinion of the High Court. It appeared that the Council had issued two summonses against the defendant for alleged contravention of the London Building Act, 1894, in erecting a building beyond the general line of buildings. The defendant Ellis had an old building at the place in question, and he started to erect two other buildings, but the Council took objection to this on the ground that, if he erected them as a separate structure, he would commit a contravention of the Act by building beyond the building line. The defendant then seemed to have made an

extension of the old building but the magistrate found as a fact that there were really two buildings and ordered the demolition of the new one. It was said that if it was an extension of the old building, its erection was not a contravention of the London Building Act. Mr. d'Eyncourt refused to state a case on the ground that the point was a frivolous one. Hence the present motion on behalf of the defendant.

Mr. Justice Darling considered that no ground had been shown for ordering a rule and that the magistrate was right in holding that the point was a frivolous one.

Mr. Justice Phillimore concurred and the application was accordingly refused.

Mr. R. Cunningham Glen appeared in support of the application.

On Monday, the 15th inst., Mr. Glen, in the Court of Appeal composed of the Master of the Rolls and Lords Justices Vaughan, Williams, and Stirling, moved, *ex parte*, on behalf of Mr. Ellis for a rule *nisi* calling on the magistrate to show cause why he should not state a case for the opinion of the High Court. The learned counsel having stated the facts,

The Master of the Rolls asked if the learned counsel contended that this was an appealable matter.

Mr. Glen said the rules laid down that when an *ex parte* application was made to the Divisional Court and refused, a similar application could be made *de novo* to the Court of Appeal.

The Master of the Rolls: You did not think fit to come here in the first instance? You tried first the Divisional Court?

Mr. Glen replied that the proceedings were in the nature of a mandamus, and an application could be made to the Court of Appeal *de novo* when refused by the court of first instance.

The Master of the Rolls: Why did the Divisional Court not grant you a rule?

Mr. Glen: Because they agreed with the magistrate that the application was frivolous. The points of law were raised before the magistrate, and he, having taken three weeks to consider those points, afterwards decided they were frivolous. I submit they are not frivolous. It is a very serious matter to the applicant because he will have thrown away 2,000*l.* if he has to demolish these buildings.

After further discussion the Master of the Rolls said he thought the best plan would be for the Court to grant a rule *nisi* calling upon the magistrate to show cause why he should not state a case because the matter was of great importance to Mr. Ellis, as it involved the pulling down of a building which had been erected if the order stood. It must not, however, be understood by the Court granting a rule that the Court considered the points of law taken on behalf of Mr. Ellis were not frivolous. The magistrate might be able to satisfy the Court that the points of law taken were frivolous, and then the order *nisi* would be set aside. In these circumstances, he thought the application should be allowed, and that the costs of this application had better stand over until the matter was decided.

The Lords Justices concurred.

Order accordingly.

CASE UNDER THE LONDON BUILDING ACT, 1894.

LONDON COUNTY COUNCIL *v.* GARDINER: BAD MORTAR.

AT the Woolwich Police-court on the 5th inst., before Mr. d'Eyncourt, the magistrate, Frederick Gardiner, of 21, Bostall Hill, Plumstead, was summoned by the London County Council for using mortar in the erection of a building in Grosmount-road, Plumstead, not composed in accordance with the by-laws of the London County Council; he was also summoned by Mr. Batterbury, District Surveyor for Plumstead and Eltham, for non-compliance with notice to amend certain irregularities committed on such buildings in Grosmount-road.

Mr. Andrews (solicitor) prosecuted for the London County Council; and Mr. Tyrrell, instructed by Mr. Llewellyn Davies, appeared for defendant.

Mr. Batterbury gave evidence to the effect that on March 4 he took samples of mortar from between the bricks of the walls and another from the mortar bed. All samples were found to contain an insufficient quantity of lime and to contain earthy matter. The Council's by-law required that the mortar should be composed of one part lime to three parts sand or grit. Notice was served on the defendant to take down the wall built with the bad mortar, but he did not comply with that notice, nor with a second one served later on, but went on carrying up the walls of the building. The mortar in question was rotten and would never bind the bricks. A portion of the wall was blown down. The composition of the mortar used by the defendant was such as to render the wall weak and unsafe.

Mr. E. W. Knight and Mr. Conder, District Surveyor of Woolwich, also gave evidence.

Mr. Grimwood, Chief Assistant Chemist to the London County Council, spoke as to the analysis of seven samples of the mortar, showing that they contained from 6·4 to 12·0 of earthy matter, from 2·0 to 9·9 of carbonate of lime, from 68·8 to 76·0 of grit, and from 2·7 to 6·6 of lime (CaO), and that the proportion of commercial lime (of 80 per cent. CaO) to sand and grit by volume varied from 1 of lime to 5·2 of grit, &c., to 1 of lime to 10·9 of grit, &c., and stated that none of the samples were in accordance with the Council's by-laws.

For the defence, it was urged that the mortar, although dark in colour, was sound. As it was difficult to get sand, sifted gravel, which contained a good deal of grit—obtained in the neighbourhood—was used in its composition.

Some workmen were called to speak as to the good quality of the mortar, one of whom caused great merriment by stating that he had seen better mortar, and then, when questioned, candidly admitted that he had never seen worse.

Mr. Tyrrell asked the Court not to adopt the drastic course of ordering the demolition of the building.

Mr. Andrews pointed out that it was the defendant himself who had brought about his present position by going on with the work after he had received notice then and there to remedy what had been complained of. But he would consent to an adjournment, if the defendant would undertake to give every facility for the District Surveyor to take samples of the mortar in those portions of the walls built after the notices had been served upon him to ascertain whether the mortar used in those portions was of any better quality than the mortar complained of.

The defendant having given the undertaking stipulated, Mr. d'Eyncourt adjourned the summonses *sine die*, but with the understanding that the case must be entered within two months.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

5,065.—JOINTS FOR DRAIN AND OTHER PIPES: *J. A. Reid.* — Additional annular recesses are fashioned at the socket and spigot ends respectively of the pipes, which can be more readily laid by resting them upon chairs, jointing material is then filled in the spaces between the pipe-ends.

5,080.—A MICROMETER GAUGE: *W. H. Lock and H. Isherwood.*—A ram mounted upon a screw-threaded spindle, and certain screw-threaded tubular parts, constitute the gauge. A feather prevents the ram from rotating. The advance or retirement of the ram is effected by turning a thimble, and the rate of that movement will be in ratio to the sum of the pitches of the right and left handed screw threads, but the movement of the ram will become due to the difference of the pitches when another thimble is turned. To the former thimble is screwed a spring-bar, of which the nose will engage with a slot cut lengthwise in the hub whereby the thimble will be locked so that its index mark shall be in line with a scale graduated upon the hub that gives the largest readings, another scale gives medium readings, whilst a scale upon the latter thimble gives the smallest readings.

5,083.—SCREW FANS FOR USE IN MINES: *C. P. Kenyon.*—The inner ends of the radial arms that carry the blades of screw fans are fastened with set screws and the blades are spread out at their peripheries with screw bolts for reducing their pitch, whilst a ring engages with recesses cut in the outer faces of the blades. Beams sustain the fan within the shaft, and eddies near the axle are obviated by means of a hanging cone.

5,098.—PROCESS OF MOULDING BRICKS: *Hall & Boardman & Hall.*—The bricks are impelled from the cutting-table or machine on to sliding sections or blocks, from which they are separated with levers, and are then forced from the sections on to a pallet and conveyed to the drying-shed. The blocks or sections, which slide upon guiding-rods, are joined to levers with cranked arms, the parallel levers being joined to links, and their lengths being extended from the middle outwards, so that the outer blocks shall acquire an increased rate of speed. Instead of the last-mentioned arrangement, however, the blocks can be set so as to slide outwards at each side of a fixed section, and to slide all together in one direction from a block fixed at their end.

5,142.—AN APPARATUS FOR CALCULATING THE SECTIONS OF BEAMS, COLUMNS, GIRDERS, &C.: *W. Dohm.*—A frame, to the central point of which a radial arm is attached, is formed of a base and a semi-circle; the T-head of an index-rule slides along the base, and screws clamp the radius-arm and the indicating-rule; scales for I-beams, together with other scales, are provided.

5,149.—A SCARIFIER FOR MACADAMISED ROADS: *W. Lambert.*—For an improvement upon the machine specified under No. 28,970 of 1897, the inventor mounts the frame upon two sets of ballast and steering wheels; the latter are carried by forked steering-shafts joined to the draw-bar with nuts and toggle-levers in order that the machine shall when propelled, repose upon one set of wheels, but, when drawn, upon the other set. When it is not being used the tines are fixed with stops; the tine-holder, or tumbler, is worked with a connecting-rod that engages with the draw-bar. For purposes of steering check-pins are to be inserted into holes in the steering-quadrants, of which the forked ends embrace the steering-shafts.

5,161.—A TRIPOD STAND FOR SURVEYING INSTRUMENTS, &c.: *C. de Redon.*—For reducing the adjustable top to small compass it is made of four frames, which are hinged to one another at different sides in such a manner that the top which carries the instrument may be levelled with screws; on the base-board are three brackets, to which the legs are joined with pins passed through holes in the brackets, and in projections from plates that are secured by means of bayonet joints to the legs; each leg is formed of an elastic band wound helix-wise, and has a point which is fixed in a hard-wood block fastened to the metal band; for increasing the stability of the tripod a cord from the middle of the base-board is secured in the ground with a fork.

5,169.—A MACHINE FOR LAYING BRICKS AND MORTAR: *F. H. Knight.*—A telescopical shoot or endless band feeds the bricks to the machine (see No. 21,823 of 1899), whilst an upper weighted or spring roller, together with side rollers, either mounted upon telescopical spindles or lowered for laying the ground course with spindled extensions, press the bricks together in their places; a bevel and spur gearing drives the rollers at a rate faster than that of the machine, and can be inclined for raising the bricks over the mortar; a spring draws the rollers inwards, or one of them may be mounted upon a pivoted arm which a spring draws inwards, and the other may be attached to a fixed spindle; the spur gearing has a friction-clutch that will slip as soon as the rollers have pressed a brick into position; as the handle of the machine is turned, a sprocket-wheel will run upon a chain which is secured to a girder that is held up with struts and brackets, and is vertically adjusted with wheel-nuts and screws; rubber rollers, pneumatical tyres, or endless bands prevent the mortar from escaping from the joints, and a scraper takes away the superfluous mortar.

5,179.—A TOOL FOR USE IN MAKING PIPE JOINTS, &C.: *F. G. White.*—A tool for compressing the joints of leaden pipes, the sheathing of electrical cables, and so on. The surfaces, being coated with mercury, have dies that are attached loosely with pins (which are passed through slots) to recesses cut in the pivoted arms. In another shape, tubular dies are set around the amalgam-covered flanges of the pipes, and are split, with tapered outside surfaces which similar surfaces will force into the recesses of the pivoted arms. The method of jointing is specified in No. 5,176 of 1900.

5,193.—TREATMENT OF WOOD: *G. F. Lebioda.*—The apparatus is devised for impregnating the fibre of tree trunks, railway sleepers, and timber in general, with dyeing, fireproofing, preserving, and similar solutions. A closed container, having a hinged end, receives the logs, into the ends of which are forced cups, having sharp edges, by hydraulic pressure. Tubes join the cups to a chamber, and the interior of each cup is joined to another chamber. Pressure into the inner chamber draws out the cups. When the cups have been forced into the timber ends, the casing is charged with a solution under great pressure, and the residue is then drawn away. The solution may be afterwards forced through the wood in the reversed direction.

5,249.—BURNERS FOR VAPOUR AND GAS: *J. Sala.*—The gas or oil feed-tube is inserted through the base of the casing of the burner (which can be used with gas) and its connecting-piece joins the burner to the lamp, heat-conductors are passed through a gauze cover of the top of the burner and inside the burner-tube which has a double outer casing that, for the use of liquid fuel, is heated with a small lamp which starts the burner, when the liquid fuel becomes vaporised and the hot air and vapour ignite over the gauze.

5,253.—MEANS OF FLUSHING AND DISINFECTING DRAINS: *J. E. Lewis.*—For flushing purposes a tipping-tank is placed within a chamber that communicates by a passage with the drain, the discharge from the tank that contains the disinfectant is controlled with a cylinder around which are pockets that, as the cylinder revolves, will fill and discharge alternately into the flushing tank. For rotating the cylinder is arranged a float that moves in guides and has a rack for engagement with a pinion and pawl upon the shaft of the cylinder which is thereby worked by only the ascent of the float.

5,271.—A CIRCULAR SAW MACHINE FOR CUTTING LATHS AND STRIPS: *B. Leitmayr.*—The wood to be sawn into thin laths or strips is clamped on to a slide worked with a rack and pinion that run loosely upon the shaft, and which a clutch throws into engagement as a roller upon the slide in its movement backward strikes an inclined plane upon the clutch-lever, a shoulder upon a spring-lever locks the end of the clutch-lever, and the slide and wood are fed forwards until a stud has pressed the spring-lever back, thereupon a weighted lever sets the clutch free and a weight returns the slide, which is provided with stops for moving a lever which keeps the wood away from the saw during the return stroke. As soon as all the wood has been sawn, a spring that forces it against the fence strikes a stop for permanently disengaging the clutch, another inclined plane forces back the laths as they are cut off the wood.

5,279.—BALL-AND-FLOAT VALVES: *J. W. Dickinson.*—This apparatus is adapted for a high-pressure service; at the end of the float-arm is a forked extension-piece pivoted on to a casing that slides

and on to two swinging arms which are pivoted on to the supply-pipe; the valve is sustained by the casing which slides upon the end of the supply-pipe, whilst the leverage exerted by the float forces the valve firmly against the supply-pipe.

5,285.—EXPANDING GIRDERS: *H. B. James.*—The inventor has devised an expanding girder for use in the construction of roofs, piers, bridges, fire-escapes, elevators, &c.; and in window-cleaning, lamp-lighting, and so on. The girder consists of pivoted bars, joined with cross-rods to parallel bars, in the form of a "lazy tongs"; the lower ends of the lower bars are attached to the support and move on guided rollers respectively, the upper ends of the upper bars are secured to a platform, and move a slider upon it, respectively. On the platform is a hand wheel for turning a screwed rod that works the slider; in another form the lower ends of the lower bars roll in guides upon the support, their ends being attached to spring or hydraulic power regulated pistons, or for the cross-rods may be substituted cross-levers, disposed in the "lazy-tongs" fashion, and the guides for the ends of all the bars are set diagonal-wise; for bridges a girder after the kind specified is expanded from either bank horizontally, the opposite platforms being fastened together.

5,288.—PAPER SEAT-GUARDS FOR WATER-CLOSETS: *D. Grant and A. Macpherson.*—Underneath the seat, which is cut radially to a small disc, is fastened a ring of paper, and upon a hanging strip are made pockets which the flush will fill with water, the used guard being thus washed away. A wire spring frame holds down the cover, and the front edge of the seat is clipped by the frame so that when the closet is used the middle part of the cover becomes burst open. Tags serve for drawing the guards from their holder, which is secured to the wall.

5,290.—AN APPLIANCE FOR SCREW-DRIVERS: *F. Gude.*—The spindle to which the blade is affixed has a cross-handle and screw-head which engages with the head that is mounted upon three legs rising from a base; the legs and the head are joined by means of spring-nuts. The workman stands upon the base and inserts the blade into the nick of the screw as he slackens the nuts and raises the spindle.

5,297.—MEANS OF STRENGTHENING CEMENT AND SIMILAR PIPES: *G. H. F. E. M. Drenckhahn and C. H. A. C. Sudhop.*—The top, bottom, and side walls of the pipes are strengthened by being thickened, or by inserting some such resistant material as hoop iron, wire, &c., in the section of the pipe that it may lie near the inner wall at the crown and sole but near the outer wall at the sides, and strengthening metal pieces are placed lengthwise within rib-shaped crossbands.

5,417.—SIPHONICAL DISCHARGE: *T. W. Woodhouse.*—A reduced opening, which is formed by fitting the upper edge of the well either wholly or partly with a flange, takes the lower portion of the bell which (for starting the flush) is firstly lifted and then allowed to fall, or the flush may be started with the pull-chain if the bell is counterpoised in the lifted position. In another shape the bell is provided with an additional concentrical flange, the well being built up upon the bottom of the tank.

MEETINGS.

THURSDAY, JULY 18—WEDNESDAY, JULY 24.

British Archæological Association.—Annual Congress, to be held at Newcastle.

MONDAY, JULY 22, TO SATURDAY, JULY 27.

Architectural Association.—Annual excursion: headquarters at Cirencester.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

July 3.—By W. DEW & SON (at Denbigh).

Llanynys, &c., Denbigh.—The Cerriglwydlon Estate (portions of), area 384 a. 3 r. 33 p., f. (in numerous lots)	£13,965

By WM. WESTON (at Paddington).

Paddington.—2, 4, 6, 14, 16, 18, and 29, Shirland-rd., u.t. 61 and 64 yrs., g.r. 66*l.*, r. 380*l.* (in lots)	3,680
Kilburn.—98, 100, 102, and 104, Cambridge-rd., f., r. 170*l.*	2,450

July 4.—By G. DURRANT & SONS (at Bungay).

Southelmham, St. Michael, Suffolk.—Two freehold and copyhold farms, 165 a. 3 r. 23 p.	1,570

July 5.—By WHITTINDALE & WATSON (at Coventry).

Walsgrave-on-Sowe, Warwick.—The Walsgrave Hall Estate, 380 a. 1 r. 27 p., f.	18,500

By MESSRS. COBB (at Sittingbourne).

Murston, Kent.—The Golden Ball b.-h. and 3 r. 38 p., f.	3,500
Freehold orchard land, 5 a. 2 r. 37 p.	1,700

By BRUTON, KNOWLES, & Co. (at Gloucester).

Painswick, Glos.—The Steanbridge Estate, 432 a., f. (in lots)	8,740

By G. DURRANT & SONS (at East Dereham).

Stanfield, &c., Norfolk.—A freehold farm, 200 a. 0 r. 16 p.	2,225

July 6.—By M. DEROME & SON (at Kendal).

Patton, Westmorland.—Oldfield End Farm, 110 a. 3 r. 28 p., f.	4,000
Whitwell, &c., Westmorland.—Whitwell Folds, 67 a. 1 r. 27 p., f.	1,750
closures of common land, 11 a. 2 r. 36 p., f.	152
Whinfell, Westmorland.—Stone Hall Farm, 35 a. 2 r. 32 p., f.	£1,420
Skelsmergh, Westmorland.—Laneside House and 15 a. 2 r. 12 p., f.	1,110
Heights Allotment, 5 a. 0 r. 10 p., f.	195

By BIDWELL & SONS (at Wisbech).

Elm, Cambs.—The Graysmoor Estate, 409 a. 2 r. 34 p., f.	11,700

By G. B. HILLIARD & SON (at Battlesbridge).

Rettendon, Essex.—Freehold cottage and 15 a. 0 r. 26 p.	400
Freehold tenement and 1 a. 2 r. 27 p.	150
High-rd., seven plots of freehold land	138

By PEIRCE & THORPE (at Northampton).

Weedon Beck, Northants.—A copyhold farm, 100 a. 1 r. 15 p.	1,825
Five enclosures of land, 57 a. 0 r. 32 p., c.	1,350
Newton's Close, 3 a. 0 r. 24 p., c.	155
Farmhouse and 0 a. 3 r. 31 p., c.	150
Enclosure of land, 15 a. 3 r. 11 p., c.	700

July 8.—By FULLER, MOON, & FULLER.

Caterham, Surrey.—Stanstead-rd., a plot of land, f.	310
Stanstead-rd., a corner building site, 1 a. 0 r. 21 p., f.	340
Stanstead-rd., enclosure of building land, 10 a. 1 r. 37 p., f.	1,460

By WM. HOUGHTON.

Walthamstow.—Havant-rd f.g.r. 30*l.*, reversion in 97 yrs.	740
133, 135, and 137, St. John's-rd., f.	870
42, Station-rd., with stabling premises, u.t. 94 yrs., g.r. 17*l.*, r. 89*l.* 14s.	450
Somers-rd., f.g.r. 6*l.*, reversion in 95½ yrs.	155
Leyton.—Leyton Marsh, freehold pasture land, 2 a. 2 r. 11 p.	120

By NORRIS & DUVALL.

Hertford.—The Balls Park Estate, 1,140 a. 3 r. 32 p., f. and c.	50,000
Part of Foxholes Farm, lands, gravel pits, &c., 77 a. 0 r. 4 p., f.	13,100
Part of Duckett's Farm, 50 a. 2 r. 6 p., f.	2,500
Great Broad Field, 8 a. 2 r. 4 p., f.	530
Little Amwell, Herts.—A freehold building estate, 27 a. 1 r. 30 p.	1,325
Hertford.—A freehold building estate, 19 a. 3 r. 22 p.	2,000
Freehold Lammas land, 28 a. 3 r. 20 p.	585
Ware, Herts.—Lady Mead enclosure, 6 a. 1 r. 19 p., f.	600

By MESSRS. RUTTER.

Kensington.—13A, Pembridge-pl., with three sets of artists' studios adjoining, f.	1,800

By ALFRED SAVILL & SON.

Sewardstone.—High-rd., the Grange and 20 a. or. 39 p., f.	2,400
High-rd., Chandler's Cottage and 6 a. 1 r. 28 p., f.	950
High-rd., Locks Hoppet, enclosure and two cottages, area 5 a. 0 r. 29 p., f.	500
High-rd., North's Croft and Chapel Field, 11 a. 2 r. 17 p., f.	940
High-rd., Cob Mead, 40 a., f.	2,000
Avey-lane, Bandon's Enclosure, 11 a. 2 r. 13 p., f.	700
Avey-lane, the Chestnuts Cottage and 0 a. 0 r. 16 p., f.	250

By SIMMONS & SONS.

Wargrave, Berks.—London-rd., a building site, 1 a. 1 r. 10 p., f.	100

By CHARLES VARLEY.

Hornsey.—23, Hornsey Pk-rd., f., e.r. 38*l.*, subject to rent charge of 4*l.* 8s. 4d.	375
Harringay.—2, Colina-rd., u.t. 80 yrs., g.r. 6*l.*, r. 32*l.* 8s.	205

By G. A. WILKINSON & SON.

City of London.—One-third share of Nos. 91, Gresham-st., and 1a, Staining-lane, u.t. 33 yrs., g.r. 95*l.*, r. 600*l.*	2,300
Surbiton, Surrey.—Surbiton-ter., f.g.r. 5*l.*, reversion in 936½ yrs.	130
Milton-Lilbourne, Wilts.—The Upper Farm, 65 a. 0 r. 22 p., f. (one-third share)	370

July 9.—By DEBENHAM, TEWSON, & Co.

Norwood.—Knight's Hill-rd., two corner plots of freehold building land	1,840
Casewick-rd., a plot of building land, f.	120
Thornlaw-rd., a plot of building land, f.	680
Uffington-rd., three plots of building land, f.	540
Uffington-rd., a corner building plot, f.	810

By DRIVERS (Holloway).

Holloway.—655 and 657, Holloway-rd., u.t. 77 yrs., g.r. 40*l.*, r. 80*l.*	500
Kentish Town.—100 and 102, Prince of Wales-rd., u.t. 39 yrs., g.r. 13*l.*	910

By HAMPTON & SONS.

Maida Vale.—37, Warrington-cres., u.t. 57 yrs., g.r. 26*l.*, e.r. 125*l.*	1,300

By NORRIS, SON, & HADLEY.

St. John's Wood.—3, Loudoun-rd., u.t. 19¼ yrs., g.r. 40*l.*, e.r. 150*l.*	330
Sevenoaks, Kent.—11, Bayham-rd., u.t. 75 yrs., g.r. 38*l.* 2s. 6d., r. 80*l.*	500

By G. PEARCE & SONS.

Holloway.—3, Fairbridge-rd, u.t. 73½ yrs., g.r. 7*l.* 7s., e.r. 48*l.*	470

By ROGERS, CHAPMAN, & THOMAS.

Pimlico.—31, Tachbrook-st., u.t. 26½ yrs., g.r. 8*l.*, r. 70*l.*	790

By WILLIAM WESTON.

Bowes Pk.—35, 36, 37, and 41, St. Michael's-rd., u.t. 79 yrs., g.r. 24*l.*, r. 112*l.*	1,000
Bayswater.—56, Archer-st., u.t. 42½ yrs., g.r. 8*l.*, r. 52*l.*	425
Paddington.—19, Titchborne-st., u.t. 20 yrs., g.r. 7*l.*, r. 54*l.*	275

By HARDS & BRADLY.

Lewisham.—198, Ennersdale-rd., u.t. 65 yrs., g.r. 4*l.* 10s.	200
Catford.—35, 37, 41, 43, and 45, Holbeach-rd., f., r. 134*l.*	2,030
Silvermere-rd., f.g.r. 8*l.*, reversion in 87 yrs.	220
Greenwich.—South-st., f.g.r. 100*l.*, reversion in 78 yrs.	2,000
Muswell Hill.—1 and 2, Maud Villas and plot of building land adjoining	510
Greenwich.—13 and 15, Billingsgate-st., and plot of land in rear, f.	500
2, Clarence-st., u.t. 23 yrs., g.r. 9*l.*, r. 50*l.*	175
Peckham.—209 and 213, Hollydale-rd., u.t. 71 yrs., g.r. 9*l.* 6s. 8d.	470
Rotherhithe.—30, 30A, 31, and 32, Trinity-rd., and 1 to 9, Mariner's Buildings	2,000
Plumstead, Kent.—52, Whitworth-rd., f.	£460

By WM. WILSON & SON (at Manchester).

Chadderton, Lancs.—Scowcroft Hall Farm, 77 a. 2 r. 12 p., also f.g.r. 28*l.* 5s., reversion in 958 yrs.	3,850

By MESSRS. COBB (at Ashford).

Willesborough, Kent.—Aylesford house and 1 a. 2 r. 4 p., f.	400
A freehold cottage	125
Bentley Field, 10 a. 1 r. 3 p., f.	500
Southerton's, &c., enclosure, 5 a. 3 r. 38 p., f.	230

By CLOUGH & Co. (at Rhyl).

Rhyl, Flint.—River-st., Gorphwysfa, f.	1,500

By SADLER & BAKER (at Blackwater.)

Yateley, Hants.—Robin's Grove and 12 a. 2 r. 7 p., c.	3,500
Hedge Croft Close, 4 a. 2 r. 18 p., c.	500

By JAMES HAXELL (at Masons' Hall Tavern).

Brixton.—Canterbury-rd., the Canterbury Hotel, u.t. 65½ yrs., g.r. 92*l.* 10s., with goodwill	28,700

By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).

Norwood.—Gipsy-rd., the Paxton Hotel, u.t. 27 yrs., r. 110*l.*, with goodwill	5,130

July 10.—By BAXTER, PAYNE, & LEPPER.

Orpington, Kent.—Main-rd., enclosure of freehold building land, 3 a. 0 r. 9 p.	1,120
High-rd., enclosures of land, 37 a. 0 r. 1 p., f.	3,700
Chelsfield, Kent.—Lower Green Farm, 44 a. 1 r. 17 p., f.	3,000
Farnborough, Kent.—High-rd., two enclosures of meadow land, 9 a. 3 r. 21 p., f.	2,300
High-rd., &c., two enclosures of meadow land, 12 a. 1 r., 20 p., f.	2,240
Bromley, Kent.—South Hill, two blocks of building land, 3 a. 0 r. 18 p., f.	1,350

By DAVID J. CHATTELL.

Chislehurst, Kent.—Bromley-lane, a freehold building site, 1 a. 1 r. 3 p.	1,000

By CURTIS & HENSON.

Edmonton.—105, Fore-st., f., r. 35*l.*	755

By GUY EWING & Co.

Leicester-sq.—Nos. 39, 40, 41, and 42, area 2,978 ft., part f. and part u.t. 74 yrs., g.r. 35*l.*	23,000

By GENDLE & SON.

Streatham.—2 and 4, Northanger-rd., u.t. 78 yrs., g.r. 20*l.*, r. 90*l.*	800

By HUMBERT & FLINT.

Rayne, Essex.—Broadfields Farm, 127 a. 0 r. 9 p., f.	1,350
Stebbing, Essex.—Porter's Hall Farm, 230 a. 0 r. 7 p., f.	1,350
Stebbing Green, &c., five enclosures of land, 29 a. 0 r. 22 p., f.	445
Church Farm, 187 a. 1 r. 35 p., f.	1,610
Stebbing Park Estate, 318 a. 0 r. 21 p., f.	3,450
The Mill House, and 5 a. 3 r. 27 p., f.	600
Bran End, five enclosures of land, 29 a. 1 r. 2 p., f.	460
White Hart Farm, 204 a. 2 r. 2 p., f.	1,550
The Allotments Field, 9 a. 0 r. 10 p., f.	130

By MARK LIELL & SONS.

Stratford.—Sugar House-lane, manufacturing premises, area 1 acre, u.t. 35 yrs., g.r. 110*l.*, e.r. 379*l.*	1,400
Forest Gate.—70, Windsor-rd., u.t. 75 yrs., g.r. 9*l.* 16s., e.r. 55*l.*	600

By RUSHWORTH & STEVENS.

Tottenham Court-rd.—61, Goodge-st., u.t. 80 yrs., g.r. 10*l.* until Lady Day, 1904, and 35*l.* for residue of term, r. 260*l.*	3,470
Pinner, Middlesex.—Woodridings, Elmleigh and Homeleigh, f., r. 95*l.*	1,400

By DOUGLAS YOUNG & Co.

Ilford, Essex.—High-rd., Clement's Wood Recreation Ground, area 2 a. 0 r. 19 p., f.	2,500
Dulwich.—Friern-rd., f.g.r.'s 48*l.*, reversion in 75 yrs.	1,300
Stockwell.—118, Landor-rd., with laundry and stabling, u.t. 73 yrs., g.r. 8*l.*, r. 60*l.*	700
Leyton.—Oakdale rd., i.g.r.'s 54*l.*, u.t. 86 yrs., g.r. 35*l.* 8s.	335

By FULLER, MOON, & FULLER (at Croydon).

Thornton Heath.—The Drive, f.g.r. 21*l.*, reversion in 88 yrs.	485
44 to 47, Gillett-rd., f., r. 78*l.*	865
52 to 70 (even), Zion-rd., f.	1,825
Croydon.—30 and 36, Whitehorse-lane, f., r. 65*l.*	910
Whitehorse-lane, The Granaries, f., r. 120*l.*	1,660
135, Clifton-rd., f., r. 28*l.*	450
71, Farnley-rd., f., r. 40*l.*	600
52 and 54, Farnley-rd., f.	705
68 to 74 (even), Farnley-rd., f.	1,010
Farnley-rd., freehold building land, with stabling premises, &c.	575
129 to 133, Bensham-lane, also a plot of building land, f.	1,450
Queen's-rd., f.g.r.'s 35*l.*, reversion in 35 yrs.	790
157 to 167 (odd), Queen's-rd., f.	1,200
Albert-rd., &c., f.g.r. 75*l.*, reversion in 70 yrs.	1,510
Thornton-rd., freehold store and yard	400
Marden Villas, f.g.r. 75*l.*, reversion in 95 yrs.	1,255

By MESSRS. KEMSLEY (at Romford).

Orsett, Essex.—Fordham's-row, 15 cottages, f.	720

By CLOUGH & Co. (at Denbigh).

Ysceifiog, Flint.—Coedmynydd and Cae Glas Farms, 162 a. 0 r. 27 p., f.	2,800
Cae Glas Ucha Farm, 43 a. 3 r. 19 p., f.	520

July 11.—By S. BRADFORD.

Haymarket.—Challis' Royal Hotel, comprising 7, 8, and 9, Coventry-st., f., and 59 to 64, Rupert-st., u.t. 67 yrs., g.r. 480*l.*, r. 1,026*l.*, total area 6,597 ft., including goodwill and mortgage	51,000

By FAREBROTHER, ELLIS, & Co.

Highbury.—7 and 9, Highbury Grange and 56, Highbury Pk., also f.g.r.'s 62*l.*, and Peppercorn ground rents, reversions in 17 and 18 yrs., and a building site in Kelross-rd., area 18,600 ft., f.	10,500

By A. & A. FIELD.

Peckham.—68, Gibbon-rd., u.t. 56 yrs., g.r. 5*l.*, r. 30*l.*	230
Sydenham.—4, St. Mark's-rd., u.t. 46 yrs., g.r. 3*l.* 10s.	130
Thornton Heath.—58, Grange Pk., u.t. 76½ yrs., g.r. 4*l.* 10s.	140
Twickenham.—1, Amyand-ter., u.t. 62 yrs., g.r. 5*l.*, r. 23*l.*	250
Hanwell.—29 and 31, St. Dunstan's-rd., f.	445
Mile End.—18, King Edward-st., f.	440
Hackney.—160, Amhurst-rd., u.t. 65 yrs., g.r. 8*l.*, r. 48*l.*	600

By C. C. & T. MOORE.

Buckhurst Hill. — Westbury-rd., Westbury and land adjoining, area 25,000 ft., f. £1,400
Rotherhithe.—51, 53, and 55, St. Marychurch-st., area 3,450 ft., f. 600
Forest Gate.—58, Hamfrith-rd. and land adjoining, f., e.r. 45*l.* 820
Mile End.—247, 249, and 251, Mile End-rd, f., r. 148*l.* 3,205
Leytonstone.—4, Forest Drive East, f., e.r. 50*l.* .. 480
Woodhouse-rd., Niell House, f. 270
Mile End.—27 to 37 (odd), Wellesley-st., u.t. 23 yrs., g.r. 18*l.* 880

NEWBON, EDWARDS, & SHEPHARD.

Stoke Newington.—24, Defoe-rd., u.t. 63½ yrs., g.r. 6*l.*, r. 30*l.* 300
Canonbury.—2, Marquess-rd., u.t. 44 yrs., g.r. 10*l.*, r. 60*l.* 455
Islington.—39, College-st., u.t. 14¾ yrs., g.r. 7*l.*, r. 34*l.* 150
Kentish Town.—6, Raglan-st., u.t. 23 yrs., g.r. 4*l.* 200
Manor Park.—41, 45, 47, and 49, Meanley-rd., u.t. 71 yrs., g.r. 5*l.* 725

ROGERS BROS.

Peckham.—147, Peckham Rye, u.t. 13½ yrs., g.r. 10*l.* 150
Claremont pl., &c., i.g.r. 56*l.*, u.t. 14 yrs., g.r. 20*l.* 185
Dulwich.—22, Gowlett-rd., u.t. 67 yrs., g.r. 7*l.*, r. 34*l.* 325

By STIMSON & SONS.

Old Kent-rd.—Canterbury-rd., f.g.r. 22*l.* 10s., reversion in 65 yrs. 565
Hatcham-rd., f.g.r. 28*l.*, reversion in 49 yrs. 625
Hatcham-rd., f.g.r. 15*l.* 15s., reversion in 44½ yrs. 385
Penarth-st., f.g.r. 28*l.*, reversion in 49 yrs. 660
Marlborough-rd., f.g.r. 20*l.*, reversion in 39 yrs. 560
Talfourd-rd., f.g.r.'s 62*l.* 10s., reversion in 60 yrs. 1,660
Camberwell.—44, Allendale-rd., u.t. 60½ yrs., g.r. 5*l.* 5s., r. 32*l.* 360
Abbey Wood, Kent.—Harrow Manor Way, &c., a block of freehold land, 9 a. 0 r. 20 p., f. 1,070
Camberwell.—5, Camberwell-rd., u.t. 48 yrs., g.r. 48*l.* r. 147*l.* 1,640
Kennington.—14 and 16, Opal-st., held subject to lives aged 73, 82 and 79, g.r. 2*l.*, with policy for 350*l.* 300
Peckham.—32, Hanover-pk., u.t. 70 yrs., g.r. 8*l.* r. 40*l.* 450
Walworth.—9, 11, and 13, Alvey-st., with stabling, &c. in rear, f., r. 105*l.* 1,650
9, 11 and 11a, Blackwood-st., u.t. 80 yrs., g.r. 18*l.* 600
44a, 44b, 48, 50 and 52, Brandon-st., u.t. 57 yrs., g.r. 38*l.*, r. 110*l.* 1,000
Dulwich.—47, Thurlow Park-rd., u.t. 76 yrs., g.r. 8*l.* 10s., r. 42*l.* 370
Stroud Green.—52 and 54, Ferme Park-rd., u.t. 77 yrs., g.r. 20*l.*, r. 111*l.* 1,110

By WILLATS & Co.

Bloomsbury.—48, High-st., f., e.r. 120*l.* 2,410

By S. & G. KINGSTON (at Holbeach).

Gedney, Lincs.—Red House Farm, 471 a. 2 r. 25 p., f. 21,000
A freehold farm, 424 a. 2 r. 21 p. 8,150
Six cottages and 1 a. 2 r. 19 p., f. 425
Holbeach, Lincs.—A freehold farm, 398 a. 1 r. 14 p. 12,000

July 12.—By C. W. DAVIES & SON.

Clapton.—54 to 68 (even), Trout-rd., u.t. 66 yrs., g.r. 32*l.* 1,700
Holloway.—89 and 91, Queensland-rd., u.t. 58 yrs., g.r. 7*l.* 10s. 365
74, 76, and 78, Hampden-rd., u.t. 69 yrs., g.r. 18*l.* 675
Islington.—493, Liverpool-rd., f., e.r. 40*l.* 500
Stoke Newington.—57 to 65 (odd), Matthias-rd., f. 965
Dalston.—76 and 78, Queen's-rd., u.t. 23½ yrs., g.r. 12*l.* 10s., r. 80*l.* 620
Hoxton.—153, St. John's-rd., u.t. 37 yrs., g.r. 19*l.* 260
Finsbury Pk.—2, Moray-mews, f., e.r. 70*l.* 680

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s	d	
Hard Stocks	1	14	0	per 1,000 alongside, in rive·
Rough Stocks and Grizzles	1	11	0	,, ,, ,,
Facing Stocks	2	12	0	,, ,, ,,
Shippers	2	8	0	,, ,, ,,
Flettons	1	8	6	,, at railway depot
Red Wire Cuts	1	14	6	,, ,, ,,
Best Fareham Red	3	11	0	,, ,, ,,
Best Red pressed Ruabon Facing.	5	5	0	,, ,, ,,
Best Blue Pressed Staffordshire	4	4	6	,, ,, ,,
Do., Bullnose	4	9	0	,, ,, ,,
Best Stourbridge Fire Bricks	4	2	6	,, ,, ,,

GLAZED BRICKS.

Best White and Ivory Glazed Stretchers	13	0	0	,, ,, ,,
Headers	12	0	0	,, ,, ,,
Quoins, Bullnose, and Flats	17	0	0	,, ,, ,,
Double Stretchers	19	0	0	,, ,, ,,
Double Headers	16	0	0	,, ,, ,,
One Side and two Ends	19	0	0	,, ,, ,,

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£	s.	d.	
Two Sides and one End	20	0	0	per 1,000 at railway depôt
Splays, Chamfered, Squints	20	0	0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	,, ,, ,,
Quoins, Bullnose, and Flats	14	0	0	,, ,, ,,
Double Stretchers	15	0	0	,, ,, ,,
Double Headers	14	0	0	,, ,, ,,
One Side and two Ends	15	0	0	,, ,, ,,
Two Sides and one End	15	0	0	,, ,, ,,
plays, Chamfered, Squints	14	0	0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed	2	0	0	,, less than best.

	s.	d.	
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	,, ,,
Best Portland Cement	35	0	per ton, delivered.
Best Ground Blue Lias Lime	25	6	,, ,,

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s	6d. per yard, delivered
Stourbridge Fire-clay in sacks	28s.	0 l. per ton at rly. dpt

STONE.

	s.	d	
Ancaster in blocks	2	0	per ft. cube, deld ly dep't.
Bath ,,	1	7	,, ,,
Farleigh Down Bath	1	8	,, ,,
Beer in blocks	1	6½	,, ,,
Grinshill ,,	1	10	,, ,,
Brown Portland in blocks	2	2	,, ,,
Darley Dale in blocks	2	1½	,, ,,
Red Corsehill ,,	2	5	,, ,,
Red Mansfield ,,	2	4½	,, ,,
Hard York in blocks	2	10	,, ,,

Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2	8	per ft. super. at rly. depôt
,, ,, 6 in. Rubbed Ditto	3	0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1	3	,, ,,
,, 2 in. self-faced Ditto	0	9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube. deld. rly. depôt.
,, ,, ,, 6-in sawn both sides landings	2	7	per ft. super. deld. rly. depôt.
,, ,, ,, 3-in. do.	1	2½	,, ,,

SLATES.

in.	in.	£	s.	d.	
20×10 best blue Bangor		11	5	0	per 1000 of 12 10 at ry. dep.
,, best seconds	,,	10	15	0	,, ,,
16× 8 best	,,	6	2	6	,, ,,
20×10 best blue Portmadoc		10	18	0	,, ,,
16× 8 best blue Portmadoc		6	0	0	,, ,,
20×10 best Eureka unfading green		11	2	6	,, ,,
16× 8 ,,	,,	6	15	0	,, ,,
20×10 Permanent green		10	0	0	,, ,,
16× 8 ,,	,,	5	12	6	,, ,,

TILES.

	s.	d.	
Best plain red roofing tiles	41	6	per 1,000 at rly. depôt.
Hip and valley tiles	3	7	per doz. ,, ,,
Best Broseley tiles	48	6	per 1,000 ,, ,,
Hip and valley tiles	4	0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000 ,, ,,
Do. ornamental Do.	60	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50	9	per 1,000 ,, ,,
Hip tiles	4	1	per doz. ,, ,,
Valley tiles	3	8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14	10	0	16	10	0
Deals: best 3 by 9	13	10	0	14	10	0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11	0	0	12	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals seconds	1	0	0	less than best		
Battens: seconds	0	10	0	,, ,, ,,		
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	10	10	0
2 in. by 4½ in. and 2 in. by 5 in.	9	0	0	10	0	0
Foreign Sawn Boards— 1 in. by 1½ in. by 1½ in.	0	10	0	more than battens.		
¾ in.	1	0	0	more than battens.		
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Swedish balks	2	15	0	3	0	0
Pitch pine timber (35 ft. average)	3	0	0	3	10	0

JOINERS' WOOD.

	At per standard.					
White Sea: First yellow deals, 3 in. by 11 in.	25	0	0	26	0	0
3 in. by 9 in.	22	0	0	23	0	0
Battens, 2½ in. and 3 in. by 7 in.	19	0	0	20	0	0
Second yellow deals, 3 in. by 11 in.	20	0	0	21	0	0
,, ,, 3 in. by 9 in.	19	0	0	20	0	0
Battens, 2½ in. and 3 in. by 7 in.	15	0	0	16	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	15	0	0	16	0	0
Battens, 2½ in. and 3 in. by 7 in.	12	0	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	22	0	0	23	0	0
Do. 3 in. by 9 in.	19	0	0	20	0	0
Battens	14	10	0	15	10	0
Second yellow deals, 3 in. by 11 in.	16	10	0	17	10	0
Do. 3 in. by 9 in.	15	0	0	16	0	0
Battens	12	0	0	12	10	0

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £	s.	d.	£	s.	d.
Third yellow deals, 3 in. by 11 in.	13	10	0	14	10	0
Do. 3 in. by 9 in.	13	0	0	13	10	0
Battens	11	10	0	12	0	0
White Sea and Petersburg:—						
First white deals, 3 in. by 11 in.	15	0	0	16	0	0
,, ,, 3 in. by 9 in.	14	0	0	15	0	0
Battens	12	0	0	13	0	0
Second white deals 3 in. by 11 in.	14	0	0	15	0	0
,, ,, ,, 3 in. by 9 in.	13	0	0	14	0	0
,, ,, battens	10	10	0	11	10	0
Pitch pine: deals	16	0	0	18	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—						
First, regular sizes	30	0	0	33	0	0
Broads (12 in. and up)	2	0	0	more.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine Oddments	20	0	0	22	0	0
Kauri Pine—						
Planks, per ft. cube	0	3	6	0	4	6
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	2	6	0	3	0
Small ,, ,,	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	0	0	7
in. do. do.	0	0	7	-	-	-
Dry Mahogany—						
Honduras, Tabasco, per ft. sup. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	16	0	0	20	0	0
American Whitewood Planks—						
Per ft. cube	0	3	0	0	3	6

Prepared Flooring—	Per square					
1 in. by 6 in. and 7 in. yellow, planed and shot	0	13	0	0	16	6
1 in. by 6 in. and 7 in. yellow, planed and matched	0	13	6	0	17	6
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0	16	0	1	1	0
1 in. by 6 in. and 7 in. white, planed and shot	0	11	0	0	13	0
1 in. by 6 in. and 7 in. white, planed and matched	0	11	6	0	13	6
1¼ in. by 6 in. and 7 in. white, planed and matched	0	14	0	0	16	6

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	7	0	0	8	0	0
Compound Girders ,, ,,	9	0	0	10	5	0
Angles, Tees and Channels, ordinary sections	8	17	6	10	17	6
Flitch Plates	9	0	0	9	15	0
Cast Iron Columns and Stanchions, including ordinary patterns	7	5	0	9	0	0

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON.—						
Common Bars	8	0	0	8	10	0
Staffordshire Crown Bars, good merchant quality	8	10	0	9	0	0
Staffordshire "Marked Bars"	10	10	0	-	-	-
Mild Steel Bars	9	0	0	9	10	0
Hoop Iron, basis price	9	5	0	9	15	0
,, ,, galvanised	16	0	0	-	-	-
(* And upwards, according to size and gauge.)						
Sheet Iron, Black.—						
Ordinary sizes to 20 g.	10	0	0	-	-	-
,, ,, to 24 g.	11	0	0	-	-	-
,, ,, to 26 g.	12	10	0	-	-	-
Sheet Iron, Galvanised, flat, ordinary quality.—						
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12	10	0	-	-	-
,, ,, 22 g. and 24 g.	13	0	0	-	-	-
,, ,, 26 g.	14	0	0	-	-	-
Sheet Iron, galvanised, flat, best quality.—						
Ordinary sizes to 20 g.	16	10	0	-	-	-
,, ,, 22 g. and 24 g.	17	0	0	-	-	-
,, ,, 26 g.	18	10	0	-	-	-
Galvanised Corrugated Sheets.—						
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12	10	0	-	-	-
,, ,, 22 g. and 24 g.	13	0	0	-	-	-
,, ,, 26 g.	14	0	0	-	-	-
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12	5	0	-	-	-
,, ,, 22 g. and 24 g.	13	5	0	-	-	-
,, ,, 26 g.	14	5	0	-	-	-
Cut nails, 3 in. to 6 in.	9	10	0	10	0	0
(Under 3 in. usual trade extras.)						

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3 lbs. & up.	15	5	0	-	-	-
Pipe in coils	15	15	0	-	-	-
Soil Pipe	18	5	0	-	-	-
ZINC—Sheet—						
Vieille Montagne ton	24	0	0	-	-	-
Silesian	23	10	0	-	-	-
COPPER—						
Strong Sheet per lb.	0	1	0½	-	-	-
Thin ,,	0	1	2	-	-	-
Copper nails ,,	0	1	2	-	-	-
BRASS—						
Strong Sheet ,,	0	0	11	-	-	-
Thin ,,	0	1	1	-	-	-
TIN—English Ingots ,,	0	1	5	-	-	-
SOLDER—Plumbers' ,,	0	0	7	-	-	-
Tinmen's ,,	0	0	8	-	-	-
Blowpipe ,,	0	0	9	-	-	-

PLASTER, &c.

	s.	d.	
Coarse Plaster	30	0	per ton delivered.
Fine ,,	38	0	,, ,,
Coarse Keenes and Parian cement	51	6	,, ,,

[*See also next page.*

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Sanitary Fittings, Alteration to Doors, Cleaning, &c.	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	July 22
Store House, Office, &c., Didcot	Great Western Railway Company	G. K. Mills, Paddington Station, W.	July 23
Additions, &c., to Station, Pembroke Dock	do.	do.	do.
Station Extension (No. 2), Manchester	L. & Y. Railway Company	R. C. Irwin, Hunt's Bank, Manchester	do.
Goods Yard, &c., Wapping, Liverpool	do.	do	do.
Flints and Granite Macadam	Southampton Corporation	W. B. G. Bennett, Engineer, Municipal Offices, Southampton	do.
Sewering, Forming, &c., Henry-street and others	Crewe Town Council	G. Eaton-Shore, Surveyor, Earl-street, Crewe	do.
Granite Paving, South-street	do.	do.	do.
Pipe Sewers, &c.	Llantrisant R.D.C.	G. S. Morgan, Surveyor, School-street, Pontyclun	do.
Brick Culvert, &c., Gibshill	Greenock Police Board	C. MacCulloch, Town Hall, Greenock	do.
Alteration of Business Premises, Pitt Hill, Durham	Beamish & West Pelton Club, Ltd	M. N. Foster, Architect, Stanley, R.S.O.	do.
Offices, Showroom, &c., Cook-lane	Keighley Corporation	Engineer, Gas Offices, Low Bridge, Keighley	do.
Street Works, Middleton-street	Amble U.D.C.	W. Gibson, Surveyor, Council Offices, Amble	do.
Shelters, Queen-street, &c.	Cardiff Corporation	W. Harpur, Civil Engineer, Town Hall, Cardiff	do.
Cottage, Edmondstown, Ireland	Ardee R.D.C.	L. Tourley, Civil Engineer, 17, Laurence-street, Drogheda	do.
Lodge, &c., Ruchill Park	Glasgow Corporation	A. B. Macdonald, Civil Engineer, City Chambers, Glasgow	July 24
Church Works, Gortin, Ireland	Rev. F. Healy	E. J. Toye, Architect, Strand, Londonderry	do.
Stables, Sheds, &c., Hull	North-Eastern Railway Company	W. Bell, Architect, York	do.
Sewerage Works, Pakefield, Lowestoft	Mutford, &c., R.D.C.	F. Peskett, 148, London-road, Lowestoft	do.
Sewerage Works, Pulteneytown, N.B.		Jas. Fraser, Civil Engineer, Inverness	do.
Grit Setts (1,000 tons)	Denton (Lancs) U.D.C.	G. H. Newton, Surveyor, Town Hall, Denton	do.
Asphalting, Pontefract-road	Castleford U.D.C.	W. Green, Surveyor, Council Offices, Castleford	do.
Two Houses, Bective-road, Kirby Lonsdale	Mr. J. Dean	J. Hutton, Architect, Kendal	do.
*Cleaning and Painting Various Stations, South	Midland Railway	Company's Architect, Cavendish House, Derby	July 25
*Making-up and Paving Road	Hackney Borough Council	Borough Engineer, Town Hall	do.
House, New-road, Llanelly	Mr. R. W. Evans	T. Arnold, Castle Buildings, Llanelly	do.
Road, Dorket Head, Arnold	Nottingham Corporation	S. Moors, St. Peter's Church Side, Nottingham	do.
School, Geneva-place	Bideford School Board	R. T. Hookway & Son, Architects, 12, Bridgeland-st., Bideford	do.
Additions, &c., to Rock House, Bideford	Mr. A. J. Lawman	do.	do.
Vicarage, near Neath	St. Olives Guardians	G. E. Halliday, Architect, 14, High-street, Cardiff	do.
*Brass Hand Rails to Staircase, Ladywell Workhouse	do.	Newman & Newman, Architects, 31, Tooley-street, S.E.	do.
*Fire Appliances, Ladywell Workhouse	Metropolitan Asylums Board	do.	do.
Additions to Infirmary, Salisbury	do.	J. Harding & Son, Architects, 58, High-street, Salisbury	July 26
*Mortuary at Leavesden Asylum	Glenbervie School Board	Surveyor to Board, Embankment, E.C.	July 27
*Cooking Appliances, Darenth Asylum	Falmouth Corporation	do.	do.
Police Court, Ton, Rhondda Valley, Glam	Leicester Corporation	Griffiths & Jones, Architects, Tonypandy	do.
House, Drumlithie, Aberdeen	Sandridge School Board	G. Gregory, Architect, Stonehaven	do.
Sanitary Conveniences, Kimberley Park	Hornsey U.D.C.	J. H. Genn, Municipal Buildings, Falmouth	do.
Gymnasium Floor, Bath-lane	East Suffolk County Council	G. E. Mawbey, Civil Engineer, Town Hall, Leicester	do.
Additions to School near St. Albans	Mountain Ash (Glam) U.D.C.	H. E. Hansell, Architect, Station Buildings, St. Albans	do.
*Library Fittings for Branch Library	Bury (Lancs) Corporation	Surveyor to Council, Southwood-lane, Highgate	July 29
Additions to Police Station, Lowestoft	Hunsgate Corporation	H. Miller, Civil Engineer, 16, Museum-street, Ipswich	do.
Service Reservoir, Perth Gelyn	Chailey (Sussex) R.D.C.	J. Mansergh, Engineer, 5, Victoria-street, S.W.	do.
Farmhouse, Stabling, &c., near Abergavenny	Stroud R.D.C.	B. J. Francis, Architect, Abergavenny	do.
Additions to Electricity Works	Sunderland Corporation	A. W. Bradley, Civil Engineer, Town Hall, Bury	July 30
*Erection of Kursaal, Ironwork	Birkenhead Union	Robt. J. Beale, A.R.I.B.A., 3, The Broadway, Westminster	Aug. 1
Hospital, House, &c.	Llandaff School Board	H. Card, Civil Engineer, 10, North-street, Lewes	do.
Additions to Asylum, Parkside, Macclesfield	Upton-on-Severn R.D.C.	H. Beswick, County Architect, Newgate-street, Chester	do.
*Sewers	King's Lynn Union	Council Offices, John-street, Stroud	do.
*Electric Tram Car Sheds	Darfield U.D.C.	Barnes & Coates, 41, Fawcett-street, Sunderland	Aug. 2
*Offices, &c.	Aberdeen Town Council	See Advertisement	Aug. 3
Schools, Ely, near Cardiff	Ipswich Corporation	E. Down, Architect, 31, High-street, Cardiff	Aug. 7
Sewerage Works, Pole Elm, &c.	Fulham Guardians	E. B. Marten, Civil Engineer, Stourbridge	Aug. 8
*New Infirmary Building	Messrs. Gibbs, Mew, & Co.	Chas. Smith & Son, Merchants, Reading	do.
Sewerage Works, near Barnsley	Nottingham School Board	Fairbank & Son, Civil Engineers, 13, Lendal, York	Aug. 12
Outfall Sewer		Burgh Surveyor, Town House, Aberdeen	Aug. 13
Service Reservoir		H. Roberts Engineer, Town Hall, Ipswich	Aug. 15
*Alterations and Additions to Workhouse		A. Saxon Snell, Architect, 22, Southampton-buildings, W.C.	do.
House, Stable, &c., Pontlottyn		J. S. Galliford, Pontlottyn, Wales	No date
Additions to Schools, Rugby		E. H. L. Barker, Architect, 146, St. Owen-street, Hereford	do.
Stables, Woolpack Inn, Salisbury		J. Harding & Son, Architects, 58, High-street, Salisbury	do.
House, Stabling, &c., Northallerton		J. Walker, North Arch House, Northallerton	do.
Additions to School, Percy-street		A. N. Bromley, Architect, Queen-street, Nottingham	do.
Warehouse, Meanwood, Leeds		M. Walker, 1, Sandhurst-terrace, Horsforth, Leeds	do.
Limestone (4,000 tons)		G. Livingstone, 17, Victoria-street, S.W.	do.
Buildings, Chimney, &c., Whaley Bridge		C. E. Bennett & Co., Birch Vale Works, Whaley Bridge	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Littlehampton U.D.C.	3*l.* 3s. per week	July 22
*Architectural Assistant	Woolwich Council	3*l.* 10s. per week	July 30
*Assistant in Drainage Department	do.	2*l.* 10s. per week	do.
*Surveyor's Assistant	do.	2*l.* 10s. per week	do.
*Clerk of Works	Newport (Salop) U.D.C.		No date
*Surveyor	Southall Norwood U.D.C.	275*l.* per annum	do.
*Temporary Assistant, Borough Surveyor's Office			do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. —. Contracts, pp.* lv. vi. viii. x. & xxiii. *Public Appointments, pp.* xxi. & xxiii.

PRICES CURRENT (*Continued*).

PLASTER, &c.

	s.	d.	
Fine Keenes and Parian cement	59	6	per ton delivered.
Robinson's Fireproof Cement	51	6	" "
Do. Finishing "	56	6	" "
(Exclusive of the ordinary charge for sacks.)			
Whiting	30	0	" "

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered.
" " fourths	3¼d.	" "
21 oz. thirds	3¼d.	" "
" " fourths	3¾d.	" "
26 oz. thirds	5d.	" "
" " fourths	4½d.	" "
32 oz. thirds	6d.	" "
" " fourths	5½d.	" "

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

Fluted sheet, 15 oz.	3½d	per ft. delivered.
" " 21 "	4½d.	" "
Hartley's Rolled Plate	3d.	" "
" " "	3½d.	" "
" " "	4d.	" "

OILS, &c.

		£	s	d.
Raw Linseed Oil in pipes	per gallon	0	2	10
" " " in barrels	"	0	2	11
" " " in drums	"	0	3	1
Boiled " " in pipes	"	0	3	0
" " " in barrels	"	0	3	1
" " " in drums	"	0	3	3
Turpentine, in barrels	"	0	2	4
" in drums	"	0	2	6
Genuine Ground English White Lead	per ton	23	0	0
Red Lead, Dry	"	24	0	0
Best Linseed Oil Putty	per cwt.	0	9	0
Stockholm Tar	per barrel	1	10	0

PRICES CURRENT (*Continued*).

VARNISHES, &c.

	per gallon £	s.	d
Fine Elastic Copal Varnish for outside work	0	16	6
Best Elastic Copal Varnish for outside work	1	0	0
Best Elastic Carriage Varnish for outside work	0	16	6
Best Hard Oak Varnish for inside work	0	10	6
Best Extra Hard Church Oak Varnish for inside work	0	10	6
Fine Hard Copal Varnish for inside work	0	16	0
Best Hard Copal Varnish for inside work	1	0	0
Best Hard Carriage Varnish for inside work	0	16	0
Extra Pale Paper Varnish	0	12	0
Best Japan Gold Size	0	10	0
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	9	0
Berlin Black	0	15	0
Knotting	0	10	0
Best French and Brush Polish	0	10	0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

AYLESBURY. — For the erection of a residence, Rickford's Hill, for Mr. W. Crouch. Mr. Fred. Taylor, architect. Quantities by the architect :—

Honour & Son	£2,700	Webster & Cannon	£2,458
Cook & Son	2,575	Green & Co.*	2,354
G. H. Gibson	2,541		

AYLESBURY.—For the erection of a pair of villas in Manor Park, for Mr. Chimes. Mr. Fred. Taylor, architect :—

J. Holland	£928	Webster & Cannon	£720
Mayne & Son	780	Green & Co.*	705

BRECHIN (N.B.).—For the erection of school buildings, Edzell, for the Edzell School Board. Mr. D. Wishart Galloway, architect, 2, Market-street, Brechin :—

Masonry.—David A. Crabb, Brechin....
Joinery.—Bruce & Son, Clepington-road, Dundee ..... } £2,000
Plumbing.—J. A. M. Fox, Edzell .....
Plastering.—Chas. Thomson, Brechin ..
Slating.—James Scott, Brechin .....

CHRISTCHURCH (Hants).—For additions to the workhouse (viz., a new boardroom and home for the nurses), for the Guardians of Christchurch Union, Hants. Mr. E. H. Burton, architect, Christchurch :—

Thos. Tiller	£4,340	S. Whittaker, Boscombe, Bournemouth*	£3,974
Miller & Sons	4,308		
Jenkins & Sons	4,260		

DERBY.—For Primitive Methodist church at Dale-road, Derby. Mr. F. S. Antliff, architect, Draycott. Quantities by architect :—

J. Young	£2,575 0 0	G. Wagg	£1,867 14 0
J. W. Chapman	2,340 0 0	W. Edwards*	1,737 4 6
A. Brown	2,315 0 0		

[All of Derby.]

DRAYCOTT.—For isolation hospital at Draycott, near Derby. Mr. F. S. Antliff, architect. Quantities by architect :—

A. Brown	£8,508 0 0	Youngman & Son	£7,817 0 0
Perks & Son	8,025 0 0	Warner Bros., Mickleover, near Derby*	7,707 4 0
A. B. Clarke	7,850 0 0		
G. Wagg	7,839 17 6		

EASTBOURNE.—For alterations and additions to De Waldern Court, Mears-road, Eastbourne, for Mr. Ralph Burdett, of North Cheam House, Surrey. Mr. Cecil A. Sharp, architect, 11, Old Queen-street, Queen Anne's-gate, S.W. :—

Cornwell & Son* £550

Electric Light Alterations.

Pearson, Ltd. £78

ELGIN.—For the erection of a residence in Forteath-avenue, Elgin. Mr. R. B. Pratt, architect, Town and County Bank Buildings, Elgin :—

Davidson & Hay, Elgin.....
Carpentering.—McKay, Dufftown .....
Plastering.—Brodie, Elgin ..... } £900
Painting.—Fordyce, Elgin .....
Slating.—Wilson, Dufftown .....

HAMPTON.—For the re-erection of the Windmill beer-house, Hampton, for Messrs. Charrington & Co. Mr. Edward Monson, architect, Acton Vale, W., and 22, Buckingham-street, Adelphi, W.C. :—

Godson & Sons	£2,200	J. J. Collings	£1,841
Lascelles & Co.	2,059	W. Blackburn, Chiswick, W.*	1,798
Antil & Co.	2,000		
J. Christie	1,978		

HARROGATE.—For the erection of a kursaal for the Corporation. Mr. Robt. J. Beale, architect, Broadway House, Westminster. Quantities supplied :—

Excavating, Bricklaying, and Masonry.

Raworth & Allen	£16,673	Graham & Sons, Huddersfield*	£14,313
H. Abbot	16,300		
Nicholson & Sons	15,486		

Carpentry and Joinery.

F. Pattinson	£7,529	J. W. Rudd	£6,139
T. Linskill	7,300	Raworth & Allen, Harrogate*	5,623
Nicholson & Sons	6,577	W. Isherwood (withdrawn)	5,188
Jas Taylor	6,490		

Slating.

Raworth & Allen	£485 0	T. Rayner	£472 1
J. W. Baynes	482 0	William Atkinson, Leeds*	369 18
J. Shepherd	475 0		

Plastering.

Johnson & Sons	£1,597 11 2	Raworth & Allen	£1,430 0 0
A. & S. Wheater	1,456 0 0	Fortune & Calverley, Harrogate*	1,410 0 0

Plumbing and Glazing.

Higginbotham & Sons	£2,200	Raworth & Allen	£2,040
J. H. Shouksmith	2,100	G. Thompson	2,000
H. Braithwaite	2,078	T. Armitage	1,995
J. Lindley	2,045	C. Foster, Harrogate*	1,971
		H. Lindley	1,885

Painting.

Jessop & Cosgrove	£415	D. E. Hutton	£359
Raworth & Allen	395	Higginbotham & Sons	350
Sparrow & Son	394	Noddings & Sons, Harrogate*	280
Broadbank & Sons	380		
R. Petty	360		

All Trades.

Geo. Warren	£32,959	Raworth & Allen	£26,522

LEIGHTON BUZZARD. — For the erection of a cottage at Southcote, for Mr. Leopold de Rothschild. Mr. Fred. Taylor, architect, Aylesbury :—

Garside & Sons	£672	G. Heley*	£665

LONDON.—For alterations to the second floor of No. 109, Fleet-street, for Messrs. Thos. Cook & Son. Messrs. Smee, Mence, & Houchin, architects, 12, West Smithfield, E.C. :—

Barrie Bros.	£338	J. V. Kiddle & Son*	£305
T. Nixon	333		

LONDON.—For two blocks of maisonettes, Bolingbroke-grove, Wandsworth. Mr. Herbert Bignold, architect, Lavender Hill, S.W. :—

R. Ward* £2,060

LONDON.—For the erection of shops and flats to be known as Uxbridge Mansions, Nos. 156 and 158, Uxbridge-road, W., for Mr. Chas. Tarrant. Mr. Alfred H. Hart, architect, 9, Staple Inn, Holborn, W.C. :—

Lyford	£4,333	Subey & Sons	£4,041
Williams	4,291	Chessum	3,952
Hastings & Ladley	4,160	Weibking & Sons*	3,549

LONDON. — For rebuilding premises in Tottenham Court-road. Mr. Alfred Conder, architect, Palace Chambers, Westminster. Quantities by Mr. E. J. Paine, 11, Great James-street, W.C. :—

Steed & Son	£3,997	B. E. Nightingale	£3,559
Grover & Son	3,966	Stimpson & Co.	3,550
McCormick & Sons	3,828	Akers & Co.	3,408
R. H. & R. Roberts	3,659	H. Young*	3,168
E. Toms	3,597		

MADRON.—Urban District Council works. Mr. Frank Latham, C.E., Penzance :—

Heamoor Sewerage Scheme.

Chas. Lang	£3,213	Geo. Miners*	£2,786
W. C. Shaddock	2,9 7	C. Brealy	2,181

Heamoor Water Supply.

Thomas & Sons	£2,455	Geo. Miners	£1,884
Chas. Lang	2,397	G. H. Davies*	1,870
W. C. Shaddock	2,388	C. Brealy	1,216

Tolcarne Water Supply.

Chas. Lang	£1,943	Stephen Rodda*	£1,495
W. C. Shaddock	1,927	Geo. Miners	1,488
Thomas & Sons	1,852	C. Brealy	1,380

MANCHESTER.—For the easterly portion of the new Church of St. George, Abbey Hey, Gorton, including chancel, vestries, chapel, &c., and two bays of nave, on behalf of the Building Committee. Messrs. C. K. & T. C. Mayor, architects, 41, John Dalton-street, Manchester :—

Burgess & Galt, of Ardwick* £3,750

MERTON.—For erecting Rutlish Science School Merton, Surrey. Mr. H. G. Quartermain, architect, Merton. Quantities supplied by Messrs. J. Leaning & Sons :—

Bulled & Co.	£4,382	Garrett & Sons	£4,178
Holliday & Greenwood	4,277	Lorden & Sons	3,944
Killby & Gayford	4,256	Smith & Sons	3,939
Gough & Co.	4,254	Parsons & Townsend	3,750
Wall & Co.	4,200	Burges & Sons	3,625

NEW MALDEN (Surrey).—For the contruction of the first portion of the roads and sewers on the New Malden Station Estate, for Colonel G. A. Petter. Mr. James Neale, F.S.A., architect and surveyor, 10, Bloomsbury-square, W.C. :—

Rawlings & Son	£11,549 0	S. Kavanagh*	£10,664 14
W. H. Wheeler	11,391 0		

* Withdrawn. Channelling omitted.

REIGATE.—For the erection of four cottages, Upper West-street, Reigate, for Mr. A. A. Pepper. Mr. C. E. Salmon, architect, Bell-street, Reigate :—

Peters & Son	£1,260	A. B. Apted	£1,084
Lee & Son	1,150	C. B. Roberts	995
E. Worssell	1,150	Thomas Nightingale, Reigate*	975
Elsey & Sons	1,134		

WANDSWORTH.—For alterations and additions to the Medical Officer's House, Wandsworth, for the Guardians of the Wandsworth and Clapham Union. Mr. Cecil A. Sharp, architect, 11, Old Queen-street, Queen Ann's Gate, S.W. :—

Merredew & Co.	£1,410	Foster Bros.	£794
F. Bendon	1,196	R. A. Jewell	749
Wilson, Bros., & Lamplough	890	F. Clarke, 92, North End, Croydon*	586

WREXHAM.—For the erection of schools for the Governors. Mr. J. H. Phillips, architect, Olive Chambers, Windsor-place, Cardiff :—

J. E. Evans	£12,575 0 0	Lewis Bros.	£9,585 0 0
Davies Bros.	9,981 14 0	E. H. Nicholas	9,470 17 3
Jas. Hughes	9,900 0 0	W. E. Samuel, Wrexham*	9,425 0 0
Gethin & Co.	9,725 0 0		

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's architect :—

ALBION HALL AND SWIMMING BATH (Dalston).—For new fire hose, &c., and periodical cleaning of fittings :—

	For Hose and Fittings.	For Examining, Cleaning, Oiling, &c., twice a year, per annum.
Heathman & Co.	£5 9 3†	£0 13 0
Merryweather & Sons, Ld.	5 2 0	1 11 6
Shand, Mason, & Co.*	4 10 0	1 10 0

† This amount is inclusive of 5s. for two hose coupling wrenches.

CHURCH MANOR WAY SITE, PLUMSTEAD (Greenwich S.).—New School.—The Board of Education have sanctioned the erection of a school to provide accommodation for 800 children on the site which has been acquired in Church Manor Way, Plumstead. Finished plans of a school to provide accommodation for 830 places (viz., boys, 276; girls, 276; infants, 278) were passed by the Committee on February 11. The school is a three-story building, and contains the following accommodation :—Halls—Boys' and girls', 58 ft. by 34 ft. ; infants', 57 ft. 3 in. by 34 ft. Classrooms—Boys' and girls', each, 60, 56, 48, 56, 56 ; infants', 60, 56, 50, 56, 56. Drawing classroom (1,260 ft. area). Also school-keeper's house. Heating by low-pressure hot-water apparatus and open fires. Area of site, 87,120 square ft. Playgrounds, area per child—Boys', 118 sq. ft. ; girls' and infants', 64 sq. ft. :—

		If walls of classrooms and halls are plastered, add
F. & H. F. Higgs	£24,227	£299
Perry & Co.	23,842	287
Holliday & Greenwood, Ltd.	23,630	261
Lawrance & Sons	23,539	270
Garrett & Son	23,293	—
Treasure & Son	23,163	274
Kirk & Randall	22,847	249
Smith & Sons, Ltd.	22,545	279
Chessum & Sons*	22,281	33

HAVERSTOCK-HILL SCHOOL (St. Pancras).—Running contract for cleaning glass roof over hall :—

The Great International Plate Glass Insurance Co., Ltd.†	—
The City Window Cleaning Co.	£1 16 8 per clean.
J. Rayman*	1 10 0 " "

† This firm has tendered on a wrong basis.

KILMORIE-ROAD SITE, STANSTEAD-ROAD, FOREST HILL (Greenwich AM).—New School.—The Board of Education have sanctioned the erection of a school for 800 children on the site which has been acquired in Kilmorie-road, Stanstead-road, Forest Hill, and the provision of a manual training centre on the site. Finished plans of a school to provide accommodation for 908 places (viz., boys', 302 ; girls', 302 ; and infants', 304) were passed by the Committee on February 11. The school is a three-story building, and contains the following accommodation :—Halls—Boys', 55 ft. 1½ in. by 32 ft. ; girls', 54 ft. 4½ in. by 34 ft. 7½ in. ; infants', 54 ft. 4½ in. by 31 ft. 3 in. Classrooms—Boys' and girls', each, 60, 56, 50, 48, 48, 40 ; infants', 60, 56, 50, 50, 48, 40. Drawing classroom (1,090 ft. area). Also a schoolkeeper's house. Heating by low-pressure hot-water apparatus and open fires. Area of site, 87,120 sq. ft. Playgrounds, area per child—boys', 94 sq. ft. ; girls' and infants', 79 sq. ft. :—

		If walls of class-rooms and halls are plastered, add
Garrett & Son	£24,786	£411
F. & H. F. Higgs	24,758	402
Antill & Co.	24,545	420
Kirk & Randall	24,172	407
Perry & Co.	23,689	425
Treasure & Son	22,931	305
Holliday & Greenwood, Ltd.	22,750	387
J. & M. Patrick*	21,787	309

MERTON-ROAD SCHOOLS (Southfields).—Enlargement.—Providing one 56 classroom for each department ; redividing classrooms A and B into three rooms of 40 each for boys and girls ; extending corridor and providing teachers' rooms for all departments ; extending boys', girls', and infants' cloakrooms ; providing new cloakroom and stockroom for boys, and converting temporary girls' teachers' room into a stockroom :—

General Builders, Ltd.	£4,363	J. Carmichael	£3,782
Allen & Sons, Ltd.	4,078	Johnson & Co., Ltd.	3,753
Garrett & Son	3,841	J. & C. Bowyer	3,686
Wall & Co.	3,832	O. Craske	3,643
Bulled & Co.	3,812	E. Triggs	3,548
F. & H. F. Higgs	3,805	J. & M. Patrick*	3,439

[See also next page.

For the supply of gymnastic apparatus :—

Articles.	T. Cruwys. per ft. run. s. d.	Heath & George. per ft. run. s. d.	G. Spencer.* † per ft. run. s. d.	Adolf A. Stempel per ft. run. s. d.
Rib-stoll, fixed and finished	11 0	11 6	11 0	8 4
Double portable boom, including standards, sliding-seats, &c., fixed in position	7 0	7 0	5 10	8 1
Low forms, fixed in position	1 11	2 0	2 3	2 1
Portable horizontal ladder, with the necessary fittings, fixed in position	7 0	6 0	6 0	9 5

† Mr. Spencer subsequently notified that a mistake had been made in this item, which should read 10s. 6d. per ft. in place of 11s. per ft.

The work at the following schools will be executed during the summer holidays—July 25 to August 24, 1901. Where exterior as well as interior work has to be done, the contractors will be allowed an additional week for the former :—

BREWHOUSE-LANE.—Painting interior and exterior :—

G. Barker	£225 0	Wall & Co.	£189 0
Corfield & Co	206 0	Gibb & Co.*	183 0
		J. F. Holliday	157 8

BYRON-STREET.—Painting exterior :—

Vigor & Co.	£239 0 0	J. Haydon	£187 15 0
T. H. Jackson	197 14 9	G. Wales	185 0 0
Gibb & Co.	189 0 0	J. T. Robey*	182 0 0

DALGLEISH-STREET.—Painting exterior :—

A. W. Derby	£181 0	G. Barker	£150 0
Vigor & Co.	164 10	J. Dolman & Co.	150 0
J. T. Robey	155 0	D. Gibb & Co.*	139 0

DEMPSEY-STREET.—Painting interior and exterior :—

A. E. Symes	£966 0	Gibb & Co.	£711 0
Dolman & Co.	751 0	A. W. Derby	690 0
Corfield & Co.	729 0	G. Barker	665 0
Vigor & Co.	712 10	J. F. Holliday*	575 0

EARL-STREET.—Painting exterior :—

E. Proctor*	£205	Vigor & Co.	£195

LAURISTON-ROAD.—Painting exterior :—

Silk & Son	£154 15	C. Willmott	£140 0
Barrett & Power	150 0	Corfield & Co.*	138 0
Dolman & Co.	150 0	G. Wales	131 0

ORCHARD-STREET.—Painting exterior :—

C. Willmott	£139	Silk & Son	£125
Barrett & Power	135	Corfield & Co.*	116
G. Wales	£90.		

PAKEMAN-STREET.—Painting interior :—

Grover & Son	£392 0 0	G. Kirby	£366 0 0
T. Cruwys	388 0 0	Stevens Bros.	346 0 0
Wall & Co	382 0 0	C.&W. Hunnings*	228 17 6

PURRETT-ROAD.—Painting interior :—

Johnson & Co.	£470 0	E. Proctor	£268 0
Hayter & Son	330 0	H. Groves*	266 10

SPRINGFIELD.—Painting interior and exterior :—

W. Hornett	£662 0	Rice & Son	£623 0
E. B. Tucker	658 0	King & Son	599 0
G. Triggs	649 0	Lorden & Son	555 15
Lathey Bros.	630 0	Garrett & Son*	538 0

SWAFFIELD-ROAD. — Painting interior and exterior :—

R. S. Ronald	£719 8 6	Johnson & Co., Ltd.	£449 0 0
J. & M. Patrick	575 0 0	Garrett & Son	436 0 0
Maxwell Bros., Ltd.	495 0 0	Lorden & Son*	422 15 0
Rice & Son	469 0 0	J. & C. Bowyer	310 0 0

UNION-STREET.—Cleaning interior :..

Johnson & Co.	£250 0	H. Groves	£169 10
W. J. Howie	190 0	A. Proctor*	160 0

VICTORY-PLACE.—Painting interior :—

Johnson & Co.	£565 0	Sayer & Son	£452 0
W. Downs	523 0	E. B. Tucker*	388 10

WALTON-STREET.—Painting exterior and cleaning interior :—

W. Brown	£189 10	W. R. & A. Hide	£163 10
C. Gurling	179 0	W. Hammond*	149 0
Lathey Bros.	179 0		

WHITFIELD-STREET.—Painting exterior and cleaning interior :—

T. L. Green	£398 0	Marchant & Hirst	£268 0
T. Cruwys	378 0	Brown & Sons*	245 10
G. Barker	528 0		

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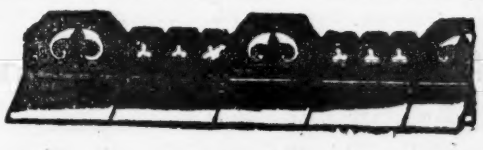

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Penfold Silver Medal	1895	1896	—	1898	1899	1900	1901
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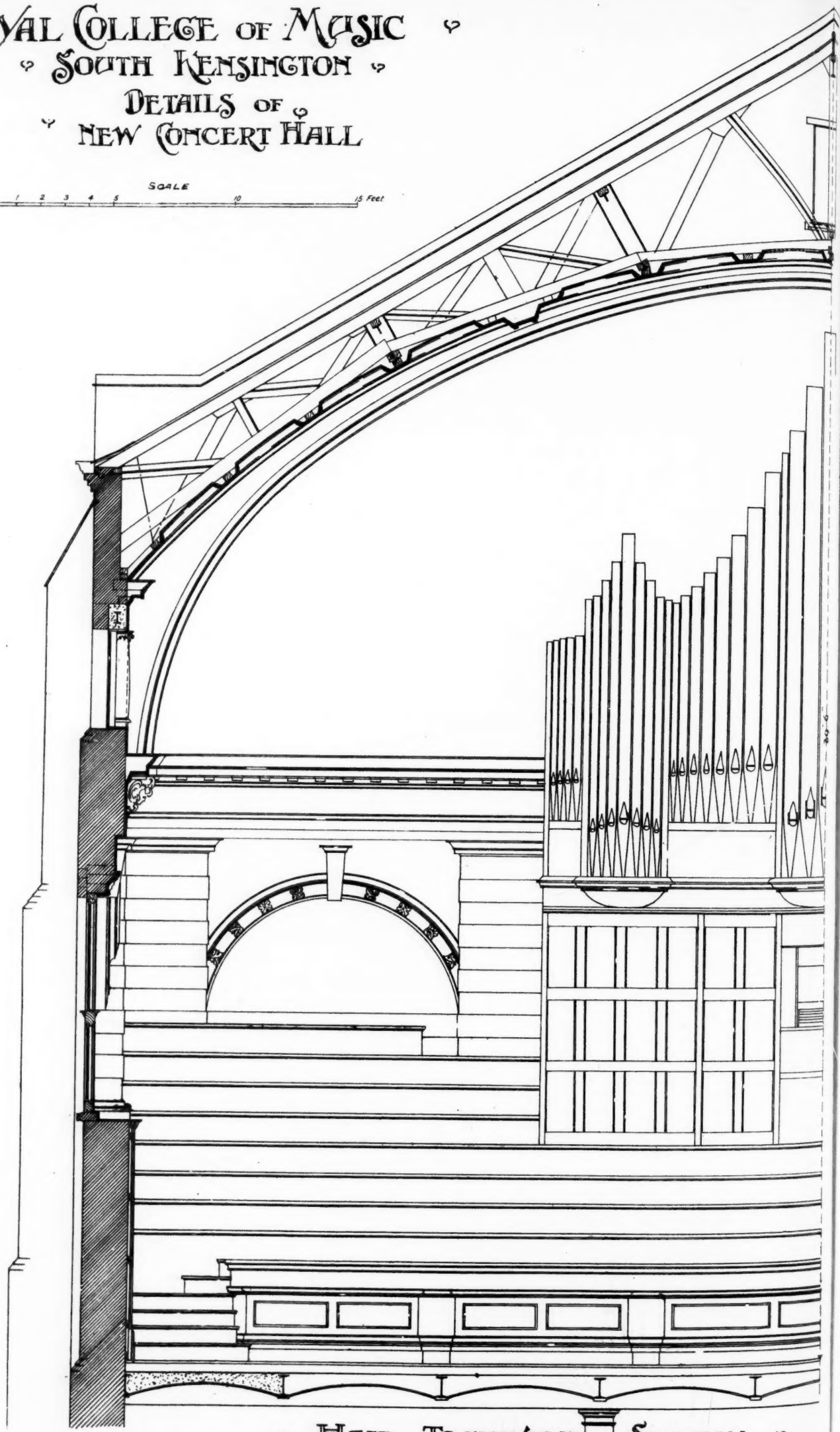

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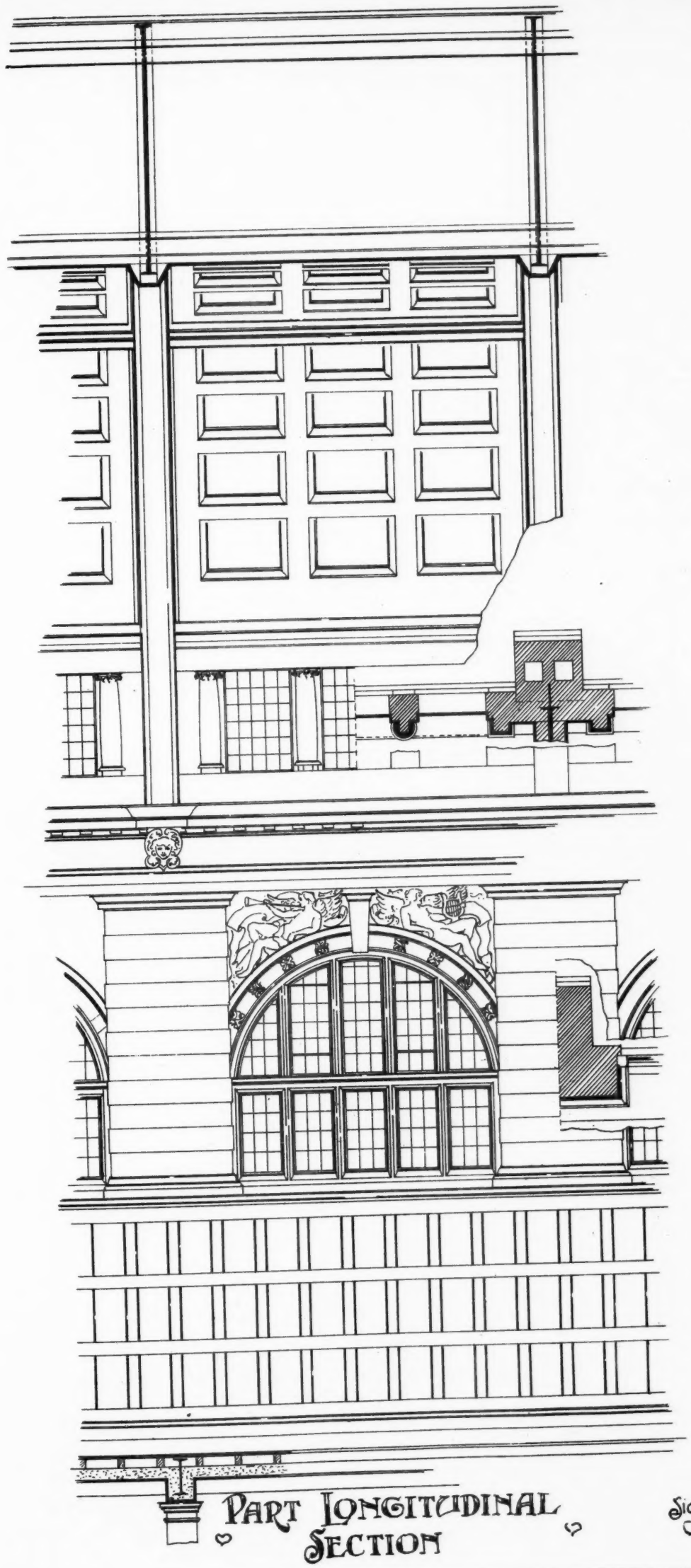

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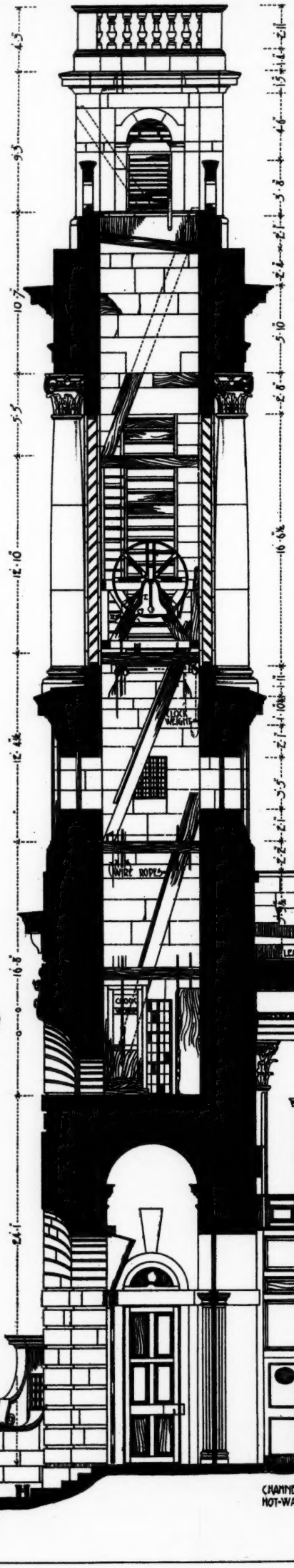

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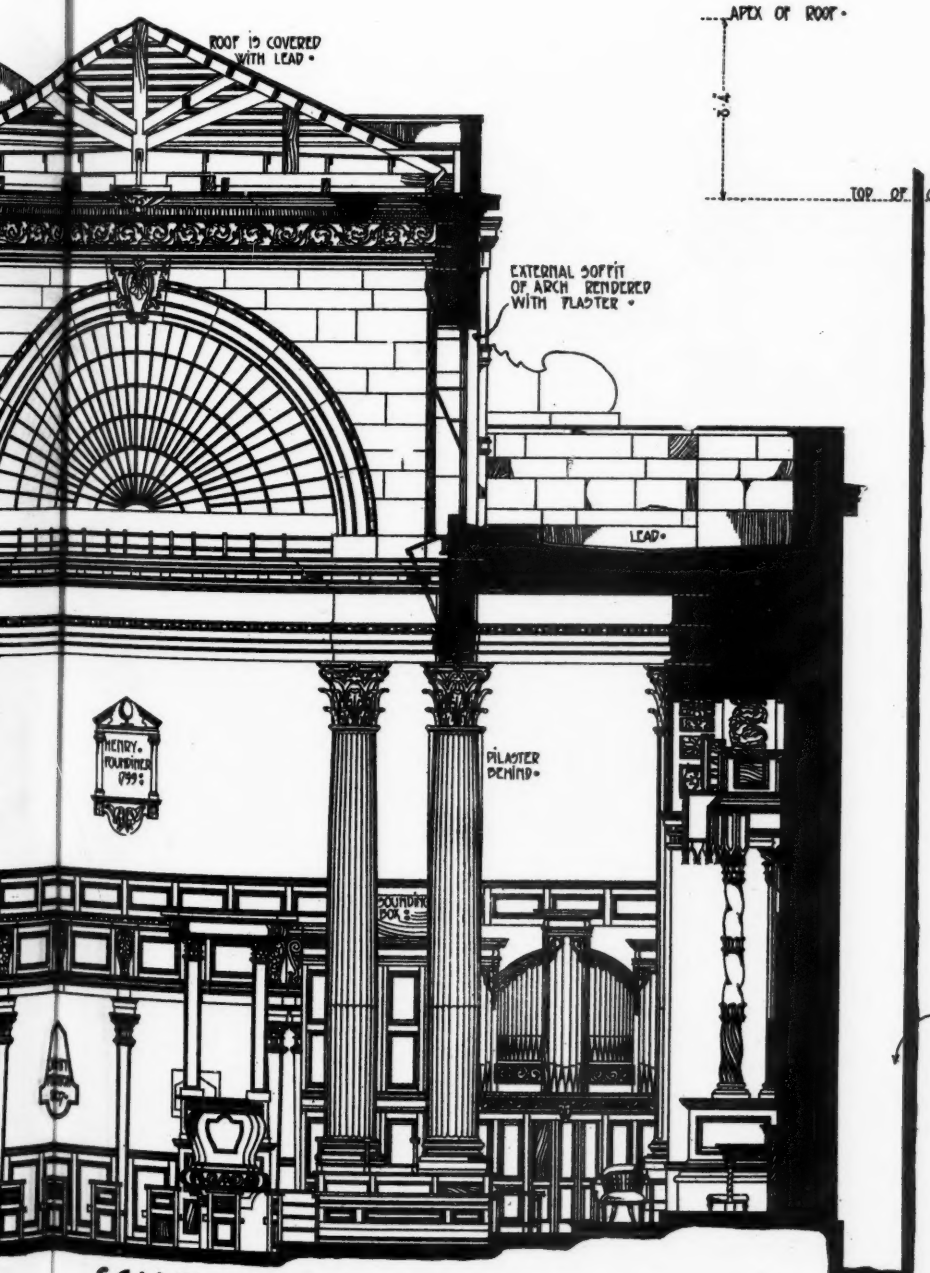
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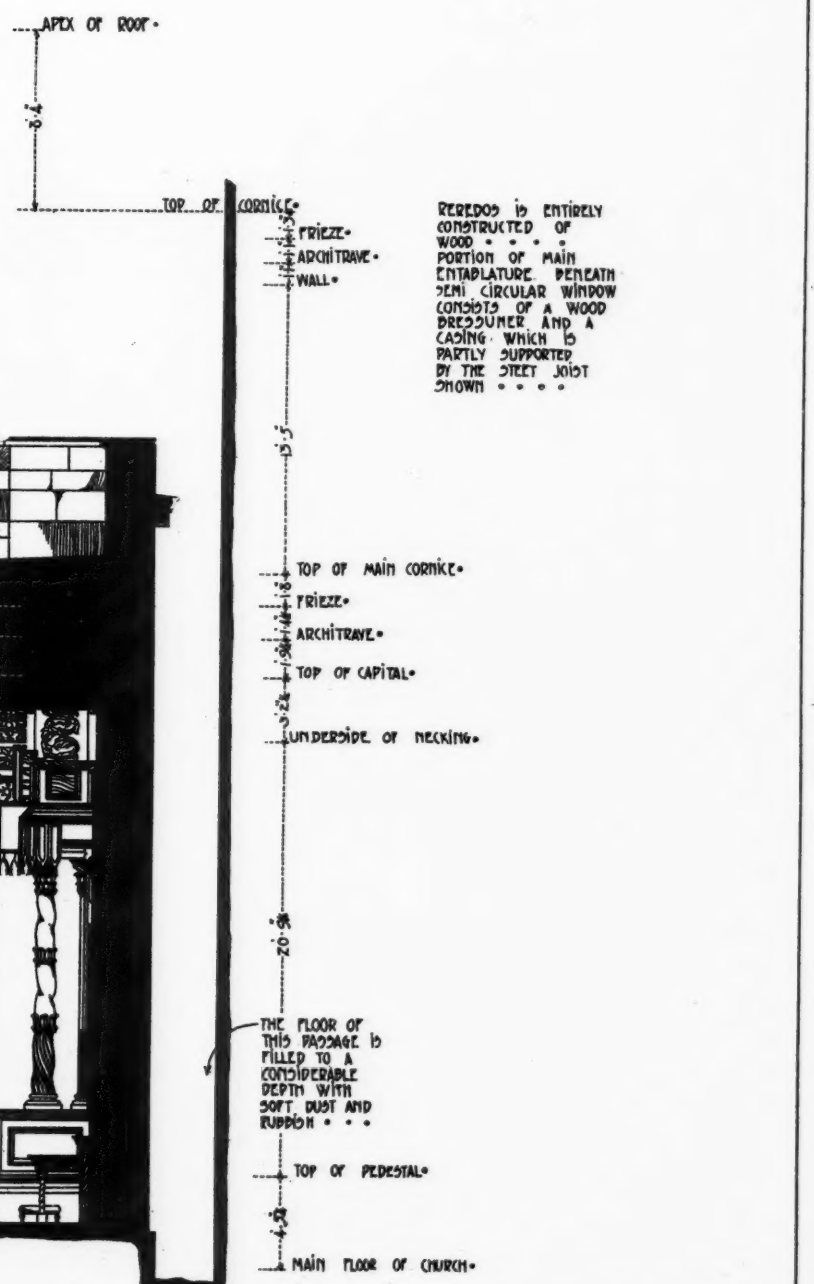
APEX OF ROOF ·
9'4"
TOP OF CORNICE ·
FRIEZE ·
ARCHITRAVE ·
WALL ·
REREDOS IS ENTIRELY CONSTRUCTED OF WOOD · · · · PORTION OF MAIN ENTABLATURE BENEATH SEMI CIRCULAR WINDOW CONSISTS OF A WOOD DRESSUMER AND A CASING · WHICH IS PARTLY SUPPORTED BY THE STEEL JOIST SHOWN · · · ·
13'5"
TOP OF MAIN CORNICE ·
FRIEZE ·
ARCHITRAVE ·
TOP OF CAPITAL ·
3'2½"
UNDERSIDE OF NECKING ·
20'5"
THE FLOOR OF THIS PASSAGE IS FILLED TO A CONSIDERABLE DEPTH WITH SOFT DUST AND RUBBISH · · ·
TOP OF PEDESTAL ·
4'3"
MAIN FLOOR OF CHURCH ·

SCALE 3 2 1 0 5 10 15 20 25 30 35 40 45 50 FEET ·

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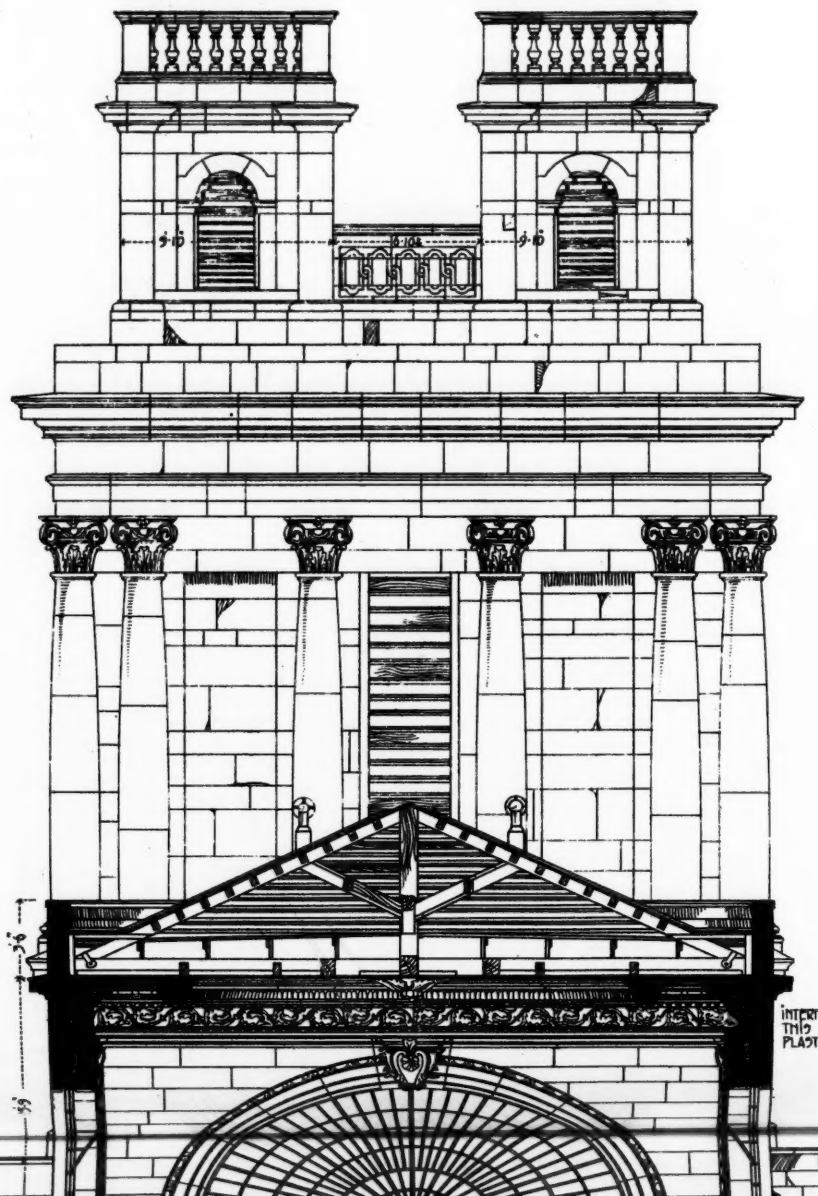

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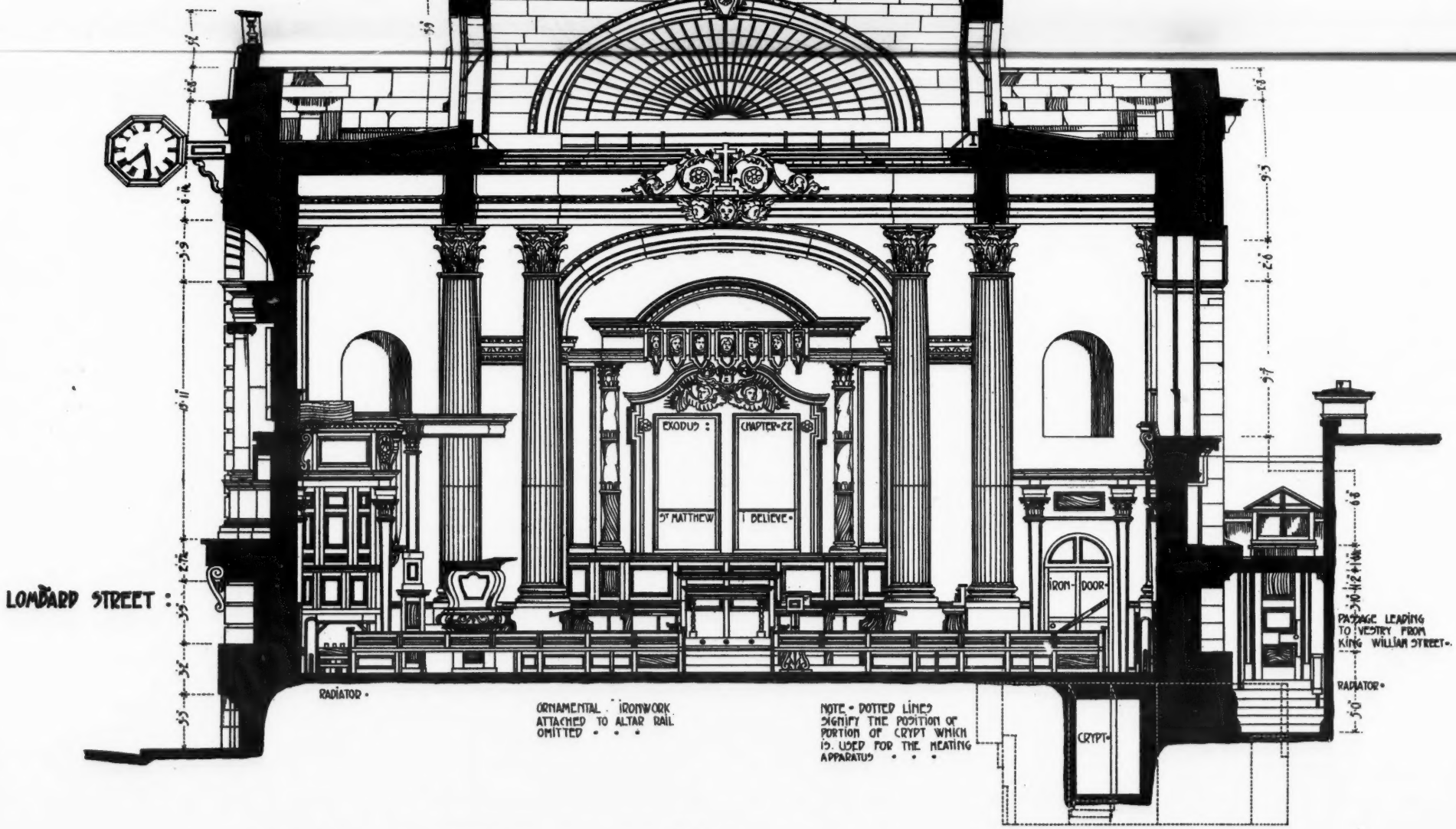
LOMBARD STREET :
EXODUS :
CHAPTER-22
ST MATTHEW
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IRON-DOOR-
RADIATOR-
PASSAGE LEADING TO VESTRY FROM KING WILLIAM STREET-
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NOTE - DOTTED LINES SIGNIFY THE POSITION OF PORTION OF CRYPT WHICH IS USED FOR THE HEATING APPARATUS - - -

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SHEWING REREDOS - ALTAR ETC :

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